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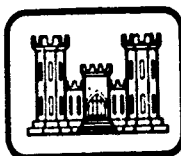
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## Volume 33, 1979

### INTRODUCTION

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The present volume contains material accessioned between October 1978 and September 1979. It contains the full citation of 4770 items, in many cases with abstracts. Pt. 2 is an index section divided into author and subject indexes. In the author index principal and joint personal and corporate authors are listed along with the title, date, pagination, and language of the document and the accession number. The subject index is composed of three basic elements: (1) terms taken from a controlled vocabulary based on the *Thesaurus of Engineering and Scientific Terms* (LEX-E JC), (2) free terms added as needed, (3) geographic names, generally entered under countries. The terms are listed in a single alphabetical arrangement, along with title (original, translated, abridged, expanded, or supplied), principal author, date, pagination, and language of pertinent documents, and their accession numbers.

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A model study of the formation of ice arching at the upstream faces of rounded bridge piers was conducted in a hydraulic flume. Polyethylene plastic was used to simulate square ice floes of two sizes, 37 mm and 74 mm. A power function relating the upstream surface ice concentration to a size ratio (characteristic block size over pier span opening) distinguishes between the arching and non-arching conditions at velocities below the critical value for overturning of individual ice floes.
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- 33-409**  
Frazil ice formation in turbulent flow.  
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To study ice nucleation and heat transfer, frazil ice was produced experimentally under controlled conditions. Turbulence was generated by a moving grid in a turbulence jar, where water could be cooled below the freezing point. Frazil was observed by means of a schlieren system and the number of ice particles was counted on photographs. No frazil ice formed, regardless of turbulence and foreign material, unless the water was seeded with ice nuclei. The number of particles grew during the experiment; the growth rate increased with greater supercooling and higher velocity of the grid. This indicates a multiplication process induced by secondary nucleation. The heat transfer per particle normalized with supercooling, and the size of the particles was constant in all experiments within the accuracy of measurement. From these observations, it can be concluded that the total ice production is predictable if the heat transfer per particle can be estimated from turbulence data and if the number of particles can be calculated. A nucleation theory is, however, not available and is regarded as the crucial question.
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Righting moment in a rectangular ice boom timber or pontoon.  
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The ability of an ice boom timber to restrain ice floes is governed by its capacity to float and to resist being overturned. Six mathematical equations that describe this capacity for a rectangular-shaped timber have been worked out and are presented here. The limits of each equation are also given. They are called righting moment equations, and from them dimensionless values of righting moment may be calculated. The equations have been evaluated for some general conditions, and for a few specific cases involving water and wood, and for one case concerned with designing a steel pontoon boom. The calculations were done by a computer program which is not included. The data provided include three graphs and two tables of dimensionless values. All in all, the information should be very useful in evaluating new designs of ice boom timbers and pontoons.
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Entrainment of ice floes into a submerged outlet.  
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Ashton, G.D.  
Floating ice, Water intakes, Water flow.  
Results of a series of laboratory experiments in a flume to determine the conditions under which floating ice floes are entrained into a submerged outlet are reported. Entrainment is found to occur when a Froude number based on outlet velocity and submergence depth is exceeded and that critical Froude number is a function of the ratio of outlet height to upstream flow depth. The critical Froude number is also shown to asymptotically approach the Froude number corresponding to equilibrium accumulation thicknesses of ice floes at a surface obstruction as the outlet height approaches the flow depth. Interpretation and application to design of submerged outlets is discussed.
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33-476

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33-479

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Hydroelectric power generation, Electric power plants, Permafrost beneath structures, Design, Wind factors, Snow loads.

33-481

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climatologic data, cooperation among agencies and individuals concerned with evaluating, planning, and carrying out water resources programs is essential. Toward this end, the Inter-Agency Technical Committee for Alaska (IATCA) was established under charter from the Water Resources Council. Representation in IATCA includes virtually all Federal, State, and academic entities in Alaska having an interest in the water resources of the State. Existence of IATCA has permitted or facilitated numerous Alaskan water resources programs. Several are described briefly in this paper.

33-493

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33-499

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- 33-503**  
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Measurements at four snow courses and 10 snow stakes within the Fort Greely, Alaska, Military Reservation were made once each month (except January) between November and May of 1968-69. The snow depths in Fort Greely ranged between 3M at a snow stake site in Nov. 1968 to 26M at another such site in Mar. 1969. Snow drifting was slight until after Feb. 1, and the snow cover densities were low (between 12 and 18 gm/cu c) until Mar. 1. Snowdrift patterns, except in the forested region in the northern section of the Reservation, began to develop after Feb. 1. In the exposed higher region where trees were sparse, the snow was blown clear but hard drifts were noted on the lee side of hill or behind brush. Twenty-four ice thickness measurements were made on Bollo Lake in Fort Greely during the winter of 1968-69. The thicknesses ranged from 7" in Nov. to 40-41" in Feb. and Mar. and because of exposure to the wind very little snow accumulated on the ice.
- 33-589  
Environmental setting, Barrow, Alaska. Brown, J., MP 542, 1968, 30p., Presented at the Conference on Productivity and Conservation in Northern Circumpolar Lands, 1968. No microfiche available.  
Environments, Arctic climates, Tundra vegetation, Tundra soils, Permafrost, Geomorphology, United States—Alaska—Barrow.
- 33-590  
Frost heave design of a chilled gas pipeline. Hwang, C.T., *Canadian Geotechnical Conference. Proceedings*, Oct. 1977, 30th, p.V/59-V/88, 23 refs.  
Gas pipelines, Subsurface structures, Frost heave, Models, Soil mechanics.
- 33-591  
Composition of sea ice and its tensile strength. Assur, A., *National Research Council. Publication*, 1958, No.598, MP 645, p.106-138, No microfiche available.  
Ice composition, Sea ice, Ice strength, Tensile strength.
- 33-592  
United States polar ice and snow studies in the International Geophysical Year. Bader, H., *American Geophysical Union. Geophysical monograph series*, July 1958, No.2, MP 646, p.177-181, No microfiche available.  
Snow surveys, Ice surveys, Polar regions, United States.
- 33-593  
Grid technique for measuring ice tunnel deformation. Butkovich, T.R., et al, *Journal of glaciology*, 1959, 3(26), MP 669, p.508-511, 3 refs. Microform No.SIP 17892.  
Landauer, J.K.  
Glacial features, Ice tunnels, Glacial deposits, Ice plasticity, Ice deformation, Measurement, Measuring instruments.  
A new method for measuring ice tunnel deformation and closure is described. It includes cutting slots into a smooth vertical wall, forcing wet dyed string into the slots, sand it in. Results of one year's installation are given for each of 13 grids installed throughout a 366 m. ice tunnel. Two important visual observations are reported. The first is that no differential shearing was found; and the second, that heavy dirt bands that occurred throughout the tunnel appeared to have extruded into the tunnel opening. A possible explanation is that dirty ice is more plastic than clear ice.
- 33-594  
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Ostro, S.J., Chandler, J.F., Pettengill, G.H., Shapiro, I.I.  
Radar echoes, Extraterrestrial ice, Albedo, Planetary environments.
- 33-595  
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Pettengill, G.H.  
Extraterrestrial ice, Planetary environments, Radar echoes, Backscattering.

- 33-596  
Evolution of ice satellite interiors and surfaces. Consolmagno, G.J., et al, *Icarus*, May 1978, 34(2), p.280-293, 22 refs.  
Lewis, J.S.  
Extraterrestrial ice, Planetary environments, Models, High pressure ice.
- 33-597  
Current status of arctic and antarctic research and prospects for further development. (Sovremennoe sostoyanie issledovaniy v Arktike i Antarktike i perspektivy ikh dal'nishnego razvitiya). Treshnikov, A.F., et al, *Problemy Arktiki i Antarktiki*, 1978, No.54, p.5-15, In Russian.  
Shamont'ev, V.A.  
Research projects.  
The scientific and engineering activities of the Arctic and Antarctic Institute in Leningrad for 1971-75 are reviewed; the aim of this program is to investigate fully the natural conditions and resources of southern and northern polar regions. The scientific concern of the Institute during the 10th 5-Year Plan is to study large-scale variations in the hydrometeorological regime around both poles. From 1976-1980 its area of concentration will be prediction of changes in the environment and natural phenomena and hydrometeorological support for arctic navigation. The POLEX program will remain a top priority.
- 33-598  
Polar experiment results and plans. (Itogi i perspektivy Poliarnogo eksperimenta). Treshnikov, A.F., et al, *Problemy Arktiki i Antarktiki*, 1978, No.54, p.16-24, In Russian.  
Sarukhanian, E.I., Smirnov, N.P.  
Research projects.  
The main results of studies carried out recently in north and south polar regions under the POLEX program are presented. Full-scale POLEX-North-76 and the Southern Ocean experiments of similar importance are described in the greatest detail. Research topics to be incorporated into POLEX plans for the future are also outlined. A proposal for an international "Southern Ocean" program is offered.
- 33-599  
Basic results and research problems of lowland and estuarine areas of arctic rivers. (Osnovnye itogi i ocherednye zadachi issledovaniy nizov'ev i ust'evykh oblastey rek Arktiki). Ivanov, V.V., *Problemy Arktiki i Antarktiki*, 1978, No.54, p.30-41, In Russian. 70 refs.  
Rivers, River basins, River flow, Arctic regions.
- 33-600  
Collecting and processing hydrometeorological data in polar regions. (Metodicheskoe obespechenie polucheniya i obrabotki gidrometeorologicheskoy informatsii v poliarnykh oblastakh). Koptev, A.P., et al, *Problemy Arktiki i Antarktiki*, 1978, No.54, p.42-51, In Russian. 9 refs.  
Samushkin, V.A.  
Data processing, Meteorological data, Computer applications.  
Management studies were conducted to identify semiautomatic methods for transmittal and processing of hydrometeorological data in polar regions. Particular attention was paid to forecasting the development and implementation of ADP in this area and to fundamental methodological research questions.
- 33-601  
Estimating navigation feasibility using data on sea ice thickness. (Isopol'zovanie dannykh o tolschinakh l'da dlia otsenki prokhodimosti ledovykh trass sudami). Sergeev, G.N., *Problemy Arktiki i Antarktiki*, 1978, No.54, p.52-56, In Russian. 3 refs.  
Sea ice, Ice navigation, Ice cover thickness, Young ice.
- 33-602  
Using side-looking radar for studying ice undersurfaces. (Isopol'zovanie gidrolokatora bokovogo obzora dlia issledovaniya podvodnykh poverkhnostey). Popov, I.K., et al, *Problemy Arktiki i Antarktiki*, 1978, No.54, p.88-92, In Russian. 2 refs.  
Rosliakov, V.N., Bogorodskii, P.V.  
Sea ice, Ice bottom surface, Ice cover, Icebergs, Ice shelves, Side looking radar, Underwater ice.  
Described herein is a technique by which side-looking radar can be used to explore the undersurface of ice shelves, floating ice and icebergs. The method, successfully practiced during the 24th voyage of the research vessel *Professor Vite*, is essentially similar to that used to define the ocean bottom.
- 33-603  
Avalanche control, forecasting, and safety—proceedings of a workshop held in Banff, Alberta, 1-4 November 1976.  
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For selected papers see 33-604 through 33-619.  
Meetings, Avalanches.
- 33-604  
Avalanche control and hazard forecasting techniques. Anderson, D., et al, *National Research Council, Canada. Associate Committee on Geotechnical Research. Technical memorandum*, Feb.1978, No.120, p.2-18.  
FitzGerald, L., Hoopingarner, K., Stratton, J.  
Avalanche countermeasures, Avalanche forecasting, Explosives.
- 33-605  
Approach to ski area avalanche control. Israelson, C., *National Research Council, Canada. Associate Committee on Geotechnical Research. Technical memorandum*, Feb.1978, No.120, p.19-23.  
Avalanche countermeasures, Metamorphism (snow).
- 33-606  
W. J. Mountain avalanche control programme. Seinem, C., et al, *National Research Council, Canada. Associate Committee on Geotechnical Research. Technical memorandum*, Feb.1978, No.120, p.24-29.  
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Avalanche countermeasures, Avalanche mechanics, Climate.
- 33-607  
Research and development of avalanche control methods in Banff National Park. Everts, K., et al, *National Research Council, Canada. Associate Committee on Geotechnical Research. Technical memorandum*, Feb.1978, No.120, p.30-41.  
Laidlaw, B.  
Avalanche countermeasures, Avalanche triggering, Explosives, Bombing.
- 33-608  
High explosives and artillery in avalanche control. Perla, R., *National Research Council, Canada. Associate Committee on Geotechnical Research. Technical memorandum*, Feb.1978, No.120, p.42-49, 3 refs.  
Avalanche countermeasures, Explosives, Avalanche triggering, Artillery.
- 33-609  
Time-delay method of avalanche control. Kobayashi, F., *National Research Council, Canada. Associate Committee on Geotechnical Research. Technical memorandum*, Feb.1978, No.120, p.50-55, 1 ref.  
Avalanche countermeasures, Explosives, Time factor, Avalanche triggering.
- 33-610  
Use of snow fences to reduce avalanche hazards. Norem, H., *National Research Council, Canada. Associate Committee on Geotechnical Research. Technical memorandum*, Feb.1978, No.120, p.67-72, 1 ref.  
Avalanche countermeasures, Snow fences, Wind factors, Topographic factors.
- 33-611  
Avalanche forecasting at Jackson Hole ski area. Simms, J., *National Research Council, Canada. Associate Committee on Geotechnical Research. Technical memorandum*, Feb.1978, No.120, p.77-86.  
Avalanche forecasting, Meteorological data, Snow mechanics.
- 33-612  
Meteorological support to avalanche forecasting in British Columbia. Gigliotti, T., et al, *National Research Council, Canada. Associate Committee on Geotechnical Research. Technical memorandum*, Feb.1978, No.120, p.97-100, 1 ref.  
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Avalanche forecasting, Meteorological data.
- 33-613  
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Avalanche forecasting, Meteorological data.
- 33-614  
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Avalanche forecasting, Weather forecasting, Snowfall, Models.
- 33-615  
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Avalanche modeling, Meteorological data, Mathematical models.
- 33-616  
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Avalanche triggering, Snow cover structure, Snow stratigraphy, Snow strength, Freeze thaw cycles.
- 33-617  
Application of numerical wind models to snow avalanche forecasting: overview. Tesche, T.W., et al, *National Research Council, Canada. Associate Committee on Geotechnical Research. Technical memorandum*, Feb.1978, No.120, p.161-176, 15 refs.  
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Avalanche forecasting, Mathematical models, Wind factors, Snowstorms.
- 33-618  
Liquid water distribution in a high altitude spring snowpack. Carrol, T., *National Research Council, Canada. Associate Committee on Geotechnical Research. Technical memorandum*, Feb.1978, No.120, p.177-185, 8 refs.  
Snow cover distribution, Snow water content, Measurement.
- 33-619  
Discussion of deformation measurements in relation to snow slab release. McClung, D.M., *National Research Council, Canada. Associate Committee on Geotechnical Research. Technical memorandum*, Feb.1978, No.120, p.186-192, 7 refs.  
Snow deformation, Measurement, Avalanche triggering, Snow strength.
- 33-620  
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Meetings, Snow mechanics, Snow physics, River ice.
- 33-621  
Historical development of ground snow loads in Canada. Boyd, D.W., *Eastern Snow Conference. Proceedings*, 1977, 34th, p.3-4.  
Snow loads, Measurement, History.
- 33-622  
Snow loads on building structures—comparison of selected U.S. standards, model codes and U.S. Federal standards. Crist, R., *Eastern Snow Conference. Proceedings*, 1977, 34th, p.4-8.  
Snow loads, Building codes, Structures, Roofs.
- 33-623  
Relationship between roof and ground snow loads—new NBC specifications—problem areas. Schriever, W.R., *Eastern Snow Conference. Proceedings*, 1977, 34th, p.8-9.  
Snow loads, Roofs, Building codes.
- 33-624  
Update on snow load research at CRREL. Tobiasson, W., et al, *Eastern Snow Conference. Proceedings*, 1977, 34th, MP 1142, p.9-13, 20 refs.  
Redfield, R.  
Snow loads, Research projects, Snow density.
- 33-625  
Alternative method for predicting roof snow loads and their variability. Isyumov, N., *Eastern Snow Conference. Proceedings*, 1977, 34th, p.14-24, Includes discussion. 4 refs.  
Snow loads, Roofs, Snow depth, Snow accumulation, Wind factors.
- 33-626  
Ground to roof conversion factors for snow loads. O'Rourke, M., *Eastern Snow Conference. Proceedings*, 1977, 34th, p.25-38.  
Snow loads, Snow density, Wind factors, Roofs.

- 33-627  
Measurement of ice growth on the Saint John River at Fredericton, N.B.  
Bray, D.I., et al, *Eastern Snow Conference. Proceedings*, 1977, 34th, p.55-68, 5 refs.  
Boyer, D.  
River ice, Ice cover thickness, Ice creep, Air temperature, Ice strength, Thermal stresses.
- 33-628  
Effect of clearcutting deciduous forest on radiation exchange and snowmelt in Canada.  
DeWalle, D.R., et al, *Eastern Snow Conference. Proceedings*, 1977, 34th, p.105-117, 4 refs.  
Parrott, H.A., Peters, J.G.  
Forests, Solar radiation, Snow melting, Albedo.
- 33-629  
Measurements of the water equivalent of freshly fallen snow.  
MacNeil, C.F., et al, *Eastern Snow Conference. Proceedings*, 1977, 34th, p.118-129, 4 refs.  
O'Neill, A.D.J.  
Snowfall, Snow density, Snow water content.
- 33-630  
Determination of snow storage for small eastern High Arctic basins.  
Woo, M.-K., et al, *Eastern Snow Conference. Proceedings*, 1977, 34th, p.147-162, 9 refs.  
Marsh, P.  
Snow surveys, Storage, River basins, Measurement, Snow depth, Snow density, Snow retention.
- 33-631  
Methodology used in generation of snow load case histories.  
McLaughlin, D., et al, *Eastern Snow Conference. Proceedings*, 1977, 34th, MP 1143, p.163-174.  
Duggan, G.  
Snow loads, Roofs, Data processing.
- 33-632  
Observations of polygonal fissuring in non-permafrost areas of the Norden countries.  
Svensson, H., *Akademie der Wissenschaften, Göttingen. Mathematisch-Physikalische Klasse. Abhandlungen, Folge 3*, 1977, No.31, p.63-76, In English with German summary. 27 refs.  
Patterned ground, Frost shattering, Seasonal freeze thaw.
- 33-633  
Study of the strength and stability of unbound mineral aggregates under spatial stress. (Studie zum Stand- und Zeitfestigkeitsverhalten von ungebundenen Mineralgemischen bei räumlicher Beanspruchung).  
Jesberger, H.L., et al, Bochum, West Germany, Ruhr-Universität. Lehrstuhl für Grundbau und Bodenmechanik, 1978, c65 leaves, In German. 27 refs.  
Dörr, R., Jordan, P.  
Construction materials, Minerals, Soil strength, Laboratory techniques, Test equipment, Stresses.
- 33-634  
Water vapor adsorption by sodium montmorillonite at -5°C.  
Anderson, D.M., et al, *Icarus*, 1978, Vol.34, MP 981, p.638-644, 8 refs.  
Schwarz, M.J., Tice, A.R.  
Water vapor, Adsorption, Low temperature tests, Clay minerals, Mars (planet).  
A large amount of interest has recently been expressed pertaining to the quantity of physically adsorbed water by the Martian regolith. Thermodynamic calculations based on experimentally determined adsorption and desorption isotherms and extrapolated to subzero temperatures indicate that physical adsorption of more than one or two monomolecular layers is highly unlikely under Martian conditions. Any additional water would find ice to be the state of lowest energy and therefore the most stable form. To test the validity of the thermodynamic calculations, we have measured adsorption and desorption isotherms of sodium montmorillonite at -5°C. To a first approximation it was found to be valid.
- 33-635  
Sulfate in antarctic snow: spatio-temporal distribution.  
Delmas, R., et al, *Atmospheric environment*, 1978, 12(1-3), p.723-728, 23 refs.  
Boutron, C.  
Snow composition, Snow impurities, Volcanic ash, Antarctica.
- 33-636  
Arctic continental shelf morphology related to sea-ice zonation, Beaufort Sea, Alaska.  
Reimnitz, E., et al, *Marine geology*, Oct. 1978, 28(3/4), p.179-210, 38 refs.  
Toimil, L., Barnes, P.  
Ice shelves, Pack ice, Bottom topography, Classifications, Bottom ice, Ice scouring, Pressure ridges.
- 33-637  
Effect of stress on strain at the onset of tertiary creep in frozen soils.  
Rein, R.G., Jr., et al, *Canadian geotechnical journal*, Aug. 1978, 15(3), p.424-426, In English with French summary. 4 refs.  
Hathi, V.V.  
Frozen ground mechanics, Soil creep, Stresses, Strains.
- 33-638  
Technique for measuring radial deformation during repeated load triaxial testing.  
Cole, D.M., *Canadian geotechnical journal*, Aug. 1978, 15(3), MP 1157, p.426-429, In English with French summary. 3 refs.  
Electric measuring instruments, Dynamic loads, Deformation.  
A system of non-contacting displacement transducers has been used to record radial deformation in repeated load triaxial tests. Operating principle, system capabilities, and installation technique are discussed. Results of tests on clay and silt subgrade materials are presented and Poisson's ratio is calculated directly from test data.
- 33-639  
Water pressure in ripe snowpacks.  
Wankiewicz, A., *Water resources research*, Aug. 1978, 14(4), p.593-600, 14 refs.  
Snow water content, Snow melting, Water pressure, Snow permeability.
- 33-640  
Chemistry of snow meltwater: changes in concentration during melting.  
Johannessen, M., et al, *Water resources research*, Aug. 1978, 14(4), p.615-619, 12 refs.  
Henriksen, A.  
Snow melting, Meltwater, Snow composition, Fallout, Water pollution, Impurities, Environmental impact.
- 33-641  
Physical measurements of river ice jams.  
Calkins, D.J., *Water resources research*, Aug. 1978, 14(4), MP 1159, p.693-695, 5 refs.  
River ice, Ice jams, Measurement, Ice cover thickness.  
River ice jam measurements have always been relatively difficult to obtain because of the uncertain stability of the floating ice mass. But recently two ice jams resolidified for about 3 weeks, allowing the ice thickness to be measured at several cross sections along their longitudinal profiles. The size distribution of surface ice floes in one of the jams was also evaluated from low-level aerial photography. The ice jams were found to be thickest at the downstream end, of the order of 4-5 times the thickness of the ice cover before breakup, and decreased almost linearly in thickness upstream. The largest surface ice floes measured in one ice jam ranged from 0.27 to 0.05 of the river's average width (45m). The largest floes were at the downstream end, and floe size decreased progressively with distance upstream.
- 33-642  
Seismic response of frozen ground.  
Finn, W.D.L., et al, *American Society of Civil Engineers. Geotechnical Engineering Division. Journal*, Oct. 1978, 104(GT10), p.1225-1241, 39 refs. For another version of this paper see 32-558.  
Yong, R.N.  
Frozen ground mechanics, Seismic prospecting, Soil moisture migration, Permafrost distribution, Soil freezing.
- 33-643  
Liquefaction of thawed layer of frozen soils.  
Finn, W.D.L., et al, *American Society of Civil Engineers. Geotechnical Engineering Division. Journal*, Oct. 1978, 104(GT10), p.1243-1255, 17 refs. For another version of this paper see 32-563.  
Yong, R.N., Lee, K.W.  
Permafrost structure, Unfrozen water content, Ground thawing, Thixotropy.
- 33-644  
Temporary tunnel support by artificial ground freezing.  
Jones, J.S., et al, *American Society of Civil Engineers. Geotechnical Engineering Division. Journal*, Oct. 1978, 104(GT10), p.1257-1276, 44 refs. For another version of this report see 32-561.  
Brown, R.E.  
Soil freezing, Artificial freezing, Tunneling (excavation), Soil strength, Dynamic loads.
- 33-645  
Repetitive loading tests on membrane enveloped road sections during freeze-thaw cycles.  
Smith, N., et al, *American Society of Civil Engineers. Geotechnical Engineering Division. Journal*, Oct. 1978, 104(GT10), MP 1158, p.1277-1288, 15 refs. For other versions of this paper see 32-562 (MP 962) and/or 32-4407 (CR 78-12, ADA-056 744).  
Eaton, R.A., Stubstad, J.  
Freeze thaw tests, Roads, Subgrade preparation, Protective coatings, Dynamic loads.  
Road test sections of impermeable membrane-enveloped silt and clay soils overlain with asphalt cement concrete were subjected to repetitive dynamic plate-bearing loadings to determine strength variations of the pavement systems during freeze-thaw cycles. The modulus values of the asphalt cement concrete vary inversely with its temperature by an order of magnitude in the temperature range of 110°F to 30°F. The resilient stiffness of the pavement system varied in the same manner by nearly a factor of eight. Despite the wide strength variations of the sections during freeze-thaw cycles, membrane enveloped fine-grained soils can be utilized instead of granular materials as base and subbase layers in flexible pavements in cold regions where moisture migration is a major concern. Without the membrane protection such fine-grained soils that experience frost heaving suffer severe bearing strength loss during thawing.
- 33-646  
Parameter effects on dynamic properties of frozen soils.  
Vinson, T.S., *American Society of Civil Engineers. Geotechnical Engineering Division. Journal*, Oct. 1978, 104(GT10), p.1289-1306, 37 refs. For another version of this paper see 32-560.  
Dynamic loads, Seismic velocity, Soil composition, Soil temperature, Ground ice.
- 33-647  
River temperature variation with freezing and storage.  
Song, C.C.S., et al, *American Society of Civil Engineers. Environmental Engineering Division. Journal*, Oct. 1978, 104(EE5), p.879-888, 4 refs.  
Leung, K.S.  
Water temperature, Air temperature, Temperature variations, Freezing points.
- 33-648  
Capillary freezing and melting.  
Enlistun, V., et al, *Journal of colloid and interface science*, July 1978, 65(3), p.509-516, 15 refs.  
Sentürk, H.S., Yurdakul, O.  
Capillary ice, Ice formation, Ice melting, Interfaces.
- 33-649  
Erosion by continental ice sheets.  
Whillans, I.M., *Journal of geology*, July 1978, 86(4), p.516-524, 31 refs.  
Ice sheets, Ice erosion, Glacial till, Theories.
- 33-650  
State of knowledge on land treatment of wastewater.  
International Symposium on the State of Knowledge in Land Treatment of Wastewater, Aug. 20-25, 1978, Hanover, New Hampshire, MP 1145, Hanover, U.S. Army Cold Regions Research and Engineering Laboratory, 1978, 2 vols., For selected papers see 33-651 through 33-661.  
Meetings, Waste treatment, Water treatment, Agriculture, Forest land, Mathematical models, Land development.  
The objectives of this Symposium are to summarize the state of knowledge of the practical aspects of the treatment of wastewater by land application and to identify the suitable approaches for the design of such land treatment systems. The topics included are: site selection considerations, case studies of national and international concern, health effects of land treatment systems, pretreatment considerations, uses of wastewaters in agricultural and forest systems, monitoring, modeling and design criteria. The Proceedings are published in two volumes. Volume 1 contains the invited papers presented and discussed at the conference. Volume 2 contains shorter papers about ongoing research that were selected from the responses received following a call for abstracts.
- 33-651  
Use of remote sensing techniques and other information sources in regional site selection of potential land treatment areas.  
Merry, C.J., MP 1146, International Symposium on the State of Knowledge in Land Treatment of Wastewater, Aug. 20-25, 1978, Hanover, New Hampshire. Proceedings, Vol.1, Hanover, U.S. Army Cold Regions Research and Engineering Laboratory, 1978, p.107-119, 27 refs.  
Site surveys, Water treatment, Waste treatment, Remote sensing, Spaceborne photography.  
Landsat, Skylab S190A Multispectral Photographic Camera, and Skylab S190B Earth Terrain Camera satellite data products, enlarged to scales of 1:500,000 and 1:250,000, were used to prepare land use maps for regional site selection of potential land treatment areas. Interpretation of tonal and textural characteristics on the photography corresponded to vegetation, ur-

ban and agricultural land use categories. Color and color infrared transparencies augmented the land use mapping, which was accomplished on black and white photographic prints. The three systems are compared in terms of areal coverage, resolution, and time of product preparation.

33-652

**Evaluation of the moving boundary theory (Darcy's flow through porous media).**

Nakano, Y., MP 1147, International Symposium on the State of Knowledge in Land Treatment of Wastewater, Aug. 20-25, 1978, Hanover, New Hampshire. Proceedings, Vol.1, Hanover, U.S. Army Cold Regions Research and Engineering Laboratory, 1978, p.142-151, 22 refs.

**Boundary value problems, Soil moisture migration, Porous materials, Analysis (mathematics), Theories.** Traditionally in hydrology and soil physics, neither the water table nor the wetting front in Darcy's flow were believed to be singular surfaces. Recently, a new and conflicting theory has been advanced, using two different approaches. It has been shown, based upon continuum physics, that across both the water table and the wetting front local acceleration generally suffers a non-zero jump, and these two boundaries can be interpreted as acceleration waves. This interpretation was found consistent with reported regularly results obtained from a purely mathematical viewpoint.

33-653

**Evaluation of N models for prediction of NO<sub>3</sub>-N in percolate water in land treatment.**

Iskandar, I.K., et al, MP 1148, International Symposium on the State of Knowledge in Land Treatment of Wastewater, Aug. 20-25, 1978, Hanover, New Hampshire. Proceedings, Vol.1, Hanover, U.S. Army Cold Regions Research and Engineering Laboratory, 1978, p.163-169, 51 refs.

Selim, H.M.

**Water treatment, Soil chemistry, Seepage, Mathematical models.**

Nitrogen simulation models developed to describe one or more processes in agricultural soils can be adopted for land treatment. The most important processes in the simulation of N transformations for prediction of N in percolate water in land treatment are: nitrification, denitrification, plant uptake and exchange of NH<sub>4</sub> with the soil. The N model must be incorporated into a moisture flow model. It was concluded that the Michaelis-Menten type model is the most appropriate, although the first order kinetic may be used to describe the nitrification process. Modeling the denitrification process in slow infiltration must include biodegradable carbon and dissolved oxygen as limiting factors. Although several large models are available to simulate and predict N in leachate in land treatment, a need for a simplified model that can be tested in the field is apparent.

33-654

**Nitrogen behavior in land treatment of wastewater: a simplified model.**

Selim, H.M., et al, MP 1149, International Symposium on the State of Knowledge in Land Treatment of Wastewater, Aug. 20-25, 1978, Hanover, New Hampshire. Proceedings, Vol.1, Hanover, U.S. Army Cold Regions Research and Engineering Laboratory, 1978, p.171-179, 15 refs.

Iskandar, I.K.

**Waste treatment, Water treatment, Soil chemistry, Seepage, Mathematical models.**

A simplified mathematical model was developed to describe transformations and transport of nitrogen under transient soil water flow conditions. Kinetic reactions were assumed to govern the nitrification and denitrification processes. A macroscopic approach was used to incorporate plant uptake of water as well as NO<sub>3</sub>-N and NH<sub>4</sub>-N from the soil solution. The sensitivity of the model to changes in rate of N transformation, N uptake by plants, and schedule and amounts of N application were also investigated. The model can be used as a tool to predict the fate of nitrogen in land treatment systems. The model is flexible and can be adapted to incorporate various nitrogen transformation mechanisms as well as layerings in the soil profile.

33-655

**Overview of existing land treatment systems.**

Iskandar, I.K., MP 1150, International Symposium on the State of Knowledge in Land Treatment of Wastewater, Aug. 20-25, 1978, Hanover, New Hampshire. Proceedings, Vol.1, Hanover, U.S. Army Cold Regions Research and Engineering Laboratory, 1978, p.193-200, 34 refs.

**Waste treatment, Water treatment, Soil chemistry, History.**

This paper reviews existing systems of land application of wastewater. Particular emphasis is placed upon the historical philosophy of the utilization of the natural soil-plant system for purifying wastewater, reasons for the success or failure of the older systems, and experience gained from their design, construction and operation.

33-656

**Uptake of nutrients by plants irrigated with municipal wastewater effluent.**

Clapp, C.E., et al, MP 1151, International Symposium on the State of Knowledge in Land Treatment of Wastewater, Aug. 20-25, 1978, Hanover, New Hampshire. Proceedings, Vol.1, Hanover, U.S. Army Cold Regions Research and Engineering Laboratory, 1978, p.395-404, 21 refs.

Palazzo, A.J., Larson, W.E., Marten, G.C., Linden, D.R.

**Nutrient cycle, Irrigation, Wastes, Water treatment, Soil chemistry.**

We present comparisons of plant nutrient uptake by corn and forage grasses when these crops were irrigated with secondary municipal wastewater effluent or treated with inorganic fertilizer. Characteristic analyses of effluent from various locations are given for the macro plant nutrients as well as for quality indicators. The importance of the presence of varying amounts of N, P, and K in effluent studies is discussed. Micro elements in effluent are considered for their use to meet nutrient requirements of these crops as well as for their potential for environmental contamination.

33-657

**Performance of overland flow land treatment in cold climates.**

Jenkins, T.F., et al, MP 1152, International Symposium on the State of Knowledge in Land Treatment of Wastewater, Aug. 20-25, 1978, Hanover, New Hampshire. Proceedings, Vol.2, Hanover, U.S. Army Cold Regions Research and Engineering Laboratory, 1978, p.61-70, 15 refs.

Martel, C.J., Gaskin, D.A., Fisk, D.J., McKim, H.L.

**Water treatment, Waste treatment, Soil chemistry, Cold weather performance.**

The objective of this study was to evaluate the performance of overland flow systems, especially during the winter months. Operation of the CRRLE overland flow facility began in May 1977 and continued through the winter of 1977-78. The results of this study indicated that satisfactory BOD removal did not occur at soil temperatures below 4°C. Based on this criterion, 105 days of storage would be needed at the CRRLE site. This is 30 days less than the storage needs predicted by the EPA-1 computer program.

33-658

**Growth and nutrient uptake of forage grasses when receiving various application rates of wastewater.**

Palazzo, A.J., et al, MP 1153, International Symposium on the State of Knowledge in Land Treatment of Wastewater, Aug. 20-25, 1978, Hanover, New Hampshire. Proceedings, Vol.2, Hanover, U.S. Army Cold Regions Research and Engineering Laboratory, 1978, p.157-163, 10 refs.

McKim, H.L.

**Nutrient cycle, Soil chemistry, Waste treatment, Grasses.**

This study reports on the growth and nutrient removal of forage grasses receiving three years of wastewater application. The forages received wastewater at various application rates and schedules and were grown in either a Windsor sandy loam or a Charlton silt loam soil. Plant and soil analyses were performed on representative samples during the study.

33-659

**Microbiological aerosols from a field source during sprinkler irrigation with wastewater.**

Baum, H.T., et al, MP 1154, International Symposium on the State of Knowledge in Land Treatment of Wastewater, Aug. 20-25, 1978, Hanover, New Hampshire. Proceedings, Vol.2, Hanover, U.S. Army Cold Regions Research and Engineering Laboratory, 1978, p.273-280, 14 refs.

Brockett, B.E., Schumacher, P.W., Schaub, S.A., McKim, H.L., Bates, R.E.

**Waste treatment, Water treatment, Irrigation, Aerosols.**

Measurements were made of the strength and dispersion of bacterial aerosols resulting from land application of chlorinated, ponded wastewater by spray irrigation. An approximately square 2.1 hectare area was covered by 96 impact sprinklers, thus creating a multi-point or field aerosol source. Visible-type and large volume electrostatic precipitator air samplers were deployed upwind and on 3 m centers in each of three downwind transects. In four runs, water to be sprayed was seeded with fluorescent dye to characterize the aerosol cloud without the effect of biological decay. During aerosol studies, continuous on-site meteorological measurements were made, and wastewater chemical parameters were monitored.

33-660

**Computer procedure for comparison of land treatment and conventional treatment: preliminary designs, cost analysis and effluent quality predictions.**

Spaine, P.A., et al, MP 1155, International Symposium on the State of Knowledge in Land Treatment of Wastewater, Aug. 20-25, 1978, Hanover, New Hampshire. Proceedings, Vol.2, Hanover, U.S. Army Cold Regions Research and Engineering Laboratory, 1978, p.335-340, 4 refs.

Merry, C.J.

**Waste treatment, Water treatment, Computer programs.**

During 1972 a manual for the design of wastewater treatment facilities was developed by the U.S. Army Engineer Waterways Experiment Station. To complement the design manual and assist the field design engineer, the computer model CAPDET (Computer Assisted Procedure for the Design and Evaluation of Wastewater Treatment Systems) was developed. In response to field users' request, a land treatment module was developed and implemented into CAPDET. The CAPDET program provides planning level design and cost evaluations for any wastewater treatment system.

33-661

**Simulation of the movement of conservative chemicals in soil solution.**

Nakano, Y., et al, MP 1156, International Symposium on the State of Knowledge in Land Treatment of Wastewater, Aug. 20-25, 1978, Hanover, New Hampshire. Proceedings, Vol.2, Hanover, U.S. Army Cold Regions Research and Engineering Laboratory, 1978, p.371-380, 14 refs.

Iskandar, I.K.

**Soil moisture migration, Soil chemistry, Mathematical models.**

A numerical method is introduced to simulate the movement of conservative chemicals in soil by water. The method is essentially based upon a finite element approximation to the equation of continuity, and each element constitutes a complete mixing cell. The number of cells represents a degree of mixing. The theoretical justification of the method is presented and the accuracy of the method is examined, using experimental data obtained from a large lysimeter. It is found that the method can simulate the general trend of the movement of chemicals reasonably well, but fails to simulate the high frequency of variations that occur near the soil surface.

33-662

**Snowfall induced by a power plant plume.**

Parungo, F.P., et al, *Geophysical research letters*, June 1978, 5(6), p.515-517, 6 refs.

Allee, P.A., Weickmann, H.K.

**Snow crystals, Ice nuclei, Aerosols, Cloud seeding.**

**33-663**

**Features of summer ice processes in the Pacific sector of Antarctica.** (Ob osobennostyakh ledovykh protsessov v tikhookeanskoy sektore Antarktiki letom).

Lutsenko, E.I., *Leningrad. Arkticheskiy i antarkticheskiy nauchno-issledovatel'skiy institut. Trudy*, 1978, Vol.345, p.133-137, 7 refs.

**Sea ice, Pack ice, Polynyas, Antarctica, South Pacific Ocean.**

Summer sea ice dynamics in the Pacific sector are analyzed and compared with those in the eastern sector. The author concludes that, compared to East Antarctic ice, the Pacific pack is a more intact and cohesive mass with extensive polynyas inside the pack. The polynyas at the divergence, characteristic of East Antarctica, are not found in the Pacific Ocean. The dynamics of the northern edge of the Pacific pack are less pronounced. Polynyas play a large role in sea ice destruction.

33-664

**Thermal stresses near the surface of a glacier.**

Sanderson, T.J.O., *Journal of glaciology*, 1978, 20(83), p.257-283, In English with French and German summaries. 47 refs.

**Glacier ice, Thermal stresses, Glacier heat balance, Temperature variations, Antarctica—George VI Ice Shelf.**

Stresses occur in the uppermost 10 m of a glacier as a result of temperature fluctuations at the surface. A model is set up of a typical year's surface temperature variation, and the progress of temperature waves through the glacier is calculated using Fourier theory of heat conduction. Short-period fluctuations are rapidly attenuated, and at 10 m depth the annual cycle is reduced to 5% of its surface amplitude. As the temperature of the ice varies it undergoes small volume changes; stresses are calculated on the assumption that any tendency of the ice to expand or contract laterally results in the creation of just enough stress to cause the ice to remain unstrained. It is found that in the top 2 or 3 m stresses of thermal origin are generally in excess of those due to gross deformation or overburden pressure. Cracks of thermal origin may be responsible for the initial formation of crevasses, and they also provide an explanation for background noise encountered when seismic shooting at low temperatures. Calculations are made of the strain-rate field surrounding a crack, and it is found that thermal effects can lead to appreciable strain-rate anomalies for strain-rate measurements near cracks. The magnitude of the effect is easily sufficient to account for anomalous fluctuating strain-rates found by workers using wire strainmeters on the Barnes Ice Cap. (Auth. mod.)

- 33-665  
Origin of foliation in glaciers.  
Hooke, R.L., et al, *Journal of glaciology*, 1978, 20(83), p.285-299, In English with French and German summaries. 45 refs.  
Hudleston, P.J.  
Glacier ice, Ice structure, Layers, Bubbles, Sediments.
- 33-666  
Surface mass-balance variability near "Byrd" Station, Antarctica, and its importance to ice core stratigraphy.  
Whillans, I.M., *Journal of glaciology*, 1978, 20(83), p.301-310, In English with French and German summaries. 22 refs.  
Ice cores, Drill core analysis, Mass balance, Ice sheets, Antarctica—Byrd Station.  
The local variability in surface mass balance (net snow accumulation) up-glacier from Byrd Station, Antarctica, is due to the combined effects of year-to-year "climate" variations and of the surface microrelief due to snow drifts and sastrugi. These variabilities are consistent with the variability in surface mass balance obtained from core stratigraphy, and are used in a discussion of the difficulties encountered with the deep Byrd Station core in detecting annual layering by the stable oxygen-isotope ratio and the microparticle concentration techniques. The recognition of annual layers by these techniques requires that the snows of certain seasons be present in the measured section, but near Byrd Station the microrelief is such that summer snow layers are not horizontally continuous and may be absent from a given section. At other sites on ice sheets, where the microrelief is less (less wind activity) or where the surface mass balance is larger, or both, less difficulty is anticipated in using the stable oxygen-isotope ratio and micro-particle-concentration techniques to identify annual layers. (Auth.)
- 33-667  
Spatial distribution of 10 m temperatures in the Antarctic Peninsula.  
Martin, P.J., et al, *Journal of glaciology*, 1978, 20(83), p.311-317, In English with French and German summaries. 19 refs.  
Peel, D.A.  
Boreholes, Temperature variations, Climate, Antarctica—Antarctic Peninsula.  
Temperatures from 10 m bore holes have been analyzed to determine the spatial variation of mean annual surface temperature over the Antarctic Peninsula. In general there is a decrease in temperature of 0.84 deg per degree latitude southwards combined with an altitude lapse rate of 0.68 deg per 100 m. There is a sharp divide between the continental type climate of the east coast and a maritime climate of the central and western regions. Temperatures are approximately 7 deg lower along the east coast compared with those at sites of a similar altitude and latitude on the west. (Auth.)
- 33-668  
Origin of the basal ice layer from alpine glaciers indicated by its chemistry.  
Souchez, R.A., et al, *Journal of glaciology*, 1978, 20(83), p.319-328, In English with French and German summaries. 20 refs.  
Lorrain, R.D.  
Glacier ice, Ice composition, Geochemistry.
- 33-669  
Determination of the mean number of bonds per snow grain and the dependence of the tensile strength of snow on stereological parameters.  
Gubler, H., *Journal of glaciology*, 1978, 20(83), p.329-341, In English with French and German summaries. 10 refs.  
Snow crystal structure, Tensile strength.
- 33-670  
Alternate statistical interpretation of the strength of snow.  
Gubler, H., *Journal of glaciology*, 1978, 20(83), p.343-357, In English with French and German summaries. 12 refs.  
Snow strength, Snow cover stability, Statistical analysis, Avalanches.
- 33-671  
Dielectric behaviour of disperse ice microcrystals in the frequency range 100,000 to 01. Hz.  
Lafargue, C., et al, *Journal of glaciology*, 1978, 20(83), p.359-365, In English with French and German summaries. 6 refs.  
Bourgeois, S., Evrard, G.  
Ice dielectrics, Ice microstructure, Dielectric properties.
- 33-672  
Glacial erosion by the Laurentide Ice Sheet.  
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Glacial erosion, Ice sheets, Landscape types, Glacial till, Models.
- 33-673  
Former ice shelves in the Canadian High Arctic.  
England, J., et al, *Journal of glaciology*, 1978, 20(83), p.393-404, In English with French and German summaries. 42 refs.  
Bradley, R.S., Miller, G.H.  
Ice shelves, Moraines, Radioactive age determination, History.
- 33-674  
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Evans, K., et al, *Journal of glaciology*, 1978, 20(83), p.409-423, In English with French and German summaries. 12 refs.  
Goodman, D.J., Holdsworth, G.  
Strain measuring instruments, Ice sheets, Recording instruments.
- 33-675  
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Squire, V.A., *Journal of glaciology*, 1978, 20(83), p.425-431, In English with French and German summaries. 11 refs.  
Strain measuring instruments, Sea ice, Periodic variations.
- 33-676  
Mechanical test procedure for avalanche snow.  
McCabe, S.L., et al, *Journal of glaciology*, 1978, 20(83), p.433-438, In English with French and German summaries. 12 refs.  
Smith, F.W.  
Strain measuring instruments, Snow mechanics, Avalanche mechanics.
- 33-677  
Temperature measurements on the Barnes Ice Cap, Baffin Island, Canada, and on Sukkertoppen Iskappe, Greenland.  
Hooke, R.L., et al, *Journal of glaciology*, 1978, 20(83), p.441-443, 7 refs.  
Koci, B.R.  
Temperature measurement, Boreholes, Ice sheets.
- 33-678  
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Kuhn, M., *Journal of glaciology*, 1978, 20(83), p.443-445, 11 refs. For the paper being commented on see 31-3357.  
Glacier oscillation, Climatic changes, Glacier mass balance.
- 33-679  
Dynamic properties of ice and frozen clay under cyclic triaxial loading conditions.  
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Chaichanavong, T.  
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- 33-680  
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Vinson, T.S., et al, *Michigan State University. Division of Engineering Research. Report*, Jan. 1977, MSU-CE-77-1, 281p., NSF Grant ENG74-13506, PB-284 952, 20 refs.  
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Frozen ground mechanics, Dynamic loads, Periodic variations, Strain tests, Soil moisture, Frozen sand, Sediments.
- 33-681  
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Hoarfrost, Crystal growth, Mathematical models.
- 33-682  
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- 33-683  
Historical climatology and snowpack response at Central Sierra Laboratory.  
Smith, J.L., Conference on Sierra Nevada Meteorology, June 19-21, 1978, Lake Tahoe, California. Preprint volume, Boston, American Meteorological Society, 1978, p.111-115.  
Snow cover, Climatology.
- 33-684  
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Kumai, M., MP 714, International Conference on Nucleation, 8th. Proceedings, Leningrad, Akademiia nauk SSSR, 1973, p.60-61, Abstract only. No microfiche available.  
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- 33-685  
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Cloud seeding, Ice crystal structure, Cloud physics, Ice nuclei, Nucleating agents, Artificial nucleation.
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Taiga soils, Taiga vegetation, Landscape types, Environmental protection, Ecosystems, Soil freezing, Frost penetration, Landscape development.
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Environmental protection, Landscape types, Vegetation, Ecosystems, Taiga soils, Soil chemistry, Human factors, Forecasting, Mathematical models.
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Landscape types, Research projects, Taiga soils, Taiga vegetation, Mapping, Ecosystems, USSR—Sayan Mountains.

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Economic development, Environmental protection, Landscape types, Human factors, Taiga soils, Taiga vegetation, USSR—Altai Mountains.
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- 33-699  
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- 33-700  
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Water supply, Water treatment, Sewage disposal, Sewage treatment, Baykal Amur railroad, Permafrost.
- 33-701  
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Power line supports, Thermopiles, Pile foundations, Design, Power lines.
- 33-702  
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This study of the geomorphological features common to ice-bound coasts is divided into the following portions: short-term marine variables (such as ice, waves, climate); terrestrial variables (such as river sediments); long-term variables (such as plate tectonics); long-term processes (erosion and deposition); and short-term erosion and deposition.

33-769

Periglacial processes. Benchmark papers in geology, No.27, Stroudsburg, Pa., Dowden, Hutchinson and Ross, 1976, 459p., Consists of reprints and reviews of articles. Refs. passim.

King, C.A.M., ed.

Periglacial processes, Frost heave, Ice wedges, Patterned ground, Permafrost weathering, Avalanche erosion, Wind factors.

33-770

Numerical simulation of the annual cycle of sea ice in the Arctic and Antarctic.

Parkinson, C.L., NCAR cooperative thesis No.46, Columbus, Ohio State University, 1978, 191p., Ph.D. thesis. Refs. p.179-191.

Sea ice, Ice models, Ice cover thickness, Dynamic properties, Thermodynamic properties.

This work describes the construction of and results from a numerical model simulating the yearly cycle of sea ice in both the northern and southern hemispheres. The model employs a rectangular grid with 200 km horizontal resolution, an 8 hr timestep, and four vertical layers—ice, snow, ocean, and atmosphere. Both thermodynamic and dynamic processes are incorporated, the thermodynamics being based on energy balances at the various interfaces and the dynamics being based on the following five stresses: wind stress, water stress, Coriolis force, internal ice resistance, and the stress from the tilt of the sea surface. The model simulates a reasonable yearly cycle of sea ice thickness and extent in both the Arctic and Antarctic. The Antarctic ice grows from a minimum in March to a maximum in late August, while the Arctic ice expands from a September minimum to a March maximum. Overall, both thicknesses and concentrations are greater in the Arctic than in the Antarctic. Maps are presented of modeled thicknesses, concentrations, and velocities, and surface energy budgets are analyzed. (Auth.)

33-771

Initial report on geological materials collected at RISP site J9, 1977-78.

Webb, P.N., comp, RISP Technical report 78-1, DeKalb, Northern Illinois University, Sep. 1978, 46p., 9 refs.

Ice shelves, Sediments, Cores, Geology.

This report summarizes the coring operations, field work, laboratory analyses and results obtained by the Ross Ice Shelf Project investigations at Site J9. Eleven gravity cores, ten sparker cores and one bottom dredge sample were obtained at the site during Dec. 1977. Core descriptions, geological site data and the results of paleontological analyses are presented. Preliminary results indicate that fossil-rich mid-Miocene glaciomarine sediments are exposed at the seafloor. There is apparently no Pliocene or Pleistocene exposed at this site, presumably the result of relatively recent grounding and erosion during the latest phase of Ross Ice Shelf history.

33-772

Dissipation of tidal energy by antarctic ice shelves.

Doake, C.S.M., *Nature*, Sep. 28, 1978, 275(5678), 304-305, 17 refs.

Ice shelves, Tides.

The possibility of tidal bending of antarctic ice shelves is examined. Using equations derived by Holdsworth (1977; 31-4440 or F-18701) for surface bending stress, average strain rate and exponential damping factor, the dissipation rate for tidal bending of antarctic ice shelves is estimated to be  $2.0 \times 10^{12}$  W. The uncertainties associated with this figure are discussed. Within the constraints imposed by the lack of data, it is suggested that extensive glaciation occurs in the periods preceding "turning points", when the Earth increases its spin velocity.

33-773

Melting of antarctic icebergs.

Donaldson, P.B., *Nature*, Sep. 28, 1978, 275(5678), p.305-306, 13 refs.

Icebergs, Ice melting, Sea water, Salinity, Calving.

This note reports some initial studies of iceberg melting relevant to towing proposals. If under-sea melting is an important ablation mechanism, then one or more of the following three effects might be detectable. (1) The lighter freshwater could rise up the sides of the iceberg with little mixing to produce a pool of less saline water. If this happens, then it would be possible for meltwater to be collected in warm waters by building a shallow pen around the iceberg. (2) The lighter freshwater may entrain warmer, saltier water from the surrounding sea and thus be responsible for considerable vertical transport of deep water and nutrients. (3) Melting could occur in a stratified manner and the freshwater may then disseminate in layers. Thus evidence of gross salinity variation near an iceberg would support mechanism (1), and a temperature rise would support mechanism (2). To test for these two mechanisms, salinities were measured around three icebergs in the northern Ross Sea/Southern Ocean. Mechanism (3) suggested only recently, was not tested. No variation of salinity with distance from icebergs was found. A temperature inversion at a depth of 50-60 m around iceberg no. 3 was recorded, but this extended for at least 2 km. It is suggested that calving is probably the most important ablation mechanism in both northern and southern waters.

33-774

Design of roads with a frost-accumulating bark layer. (Dimensjonering av vegger med frostakkumulerende underlag).

Knutson, A., Norway. *Veglaboratoriet. Meddelelser*, Dec. 1972, No.43, p.3-13, In Norwegian and English. 12 refs.

Thermal insulation, Roadbeds, Frost protection, Subgrade preparation, Bark, Design.

33-775

Durability of bark in road construction. (Barkens bestandighet i vegfundamenter).

Solbraa, K., Norway. *Veglaboratoriet. Meddelelser*, Dec. 1972, No.43, 15-26, In Norwegian with English summary. 15 refs.

Roadbeds, Frost protection, Construction, Subgrade preparation, Bearing strength, Bark, Thermal insulation, Decomposition.

33-776

Bark in Norway. (Bark i Norge).

Klem, G.S., Norway. *Veglaboratoriet. Meddelelser*, Dec. 1972, No.43, p.27-29, In Norwegian with English summary. 2 refs.

Thermal insulation, Subgrade preparation, Roadbeds, Bark.

33-777

Australia may benefit as iceberg idea is refloated. *World water*, June 1978, p.32-34.

Icebergs, Water supply, Ice (water storage).

This discussion focuses on various aspects of the studies being conducted by Iceberg Transport International (ITI) chaired by Prince Faisal of Saudi Arabia, on the feasibility of towing antarctic icebergs. ITI has earmarked Bouvet I. and Australia's Heard I. as pick-up fields for tabular icebergs. An estimated 3-mo journey would bring them to the Australian coast where the best reception sites discovered so far—determined by depressions in the continental shelf sufficient to allow passage of the bergs' huge draught—are 35 km from Robe in South Australia and Rottnest I. in Western Australia. Further surveying will determine the feasibility of other sites. Proposed methods for locating and insulating icebergs, and delivering the water to shore are outlined. The utilization of iceberg water to fill oil tankers returning to Saudi Arabia from South African ports is briefly considered, as are the legal, ecological, and economic aspects of iceberg transport.

33-778

Icebergs to Arabia.

Dodson, R.H.T., *Focus*, Sep.-Oct. 1978, 29(1), p.10-16, 5 refs.

Icebergs, Ice (water storage), Insulation, Water supply, Economic development, Iceberg towing.

The prospect of transporting icebergs from Antarctica as a means of relieving the world's fresh water shortage is examined. Iceberg supply, towing methods, towing dynamics, the problem of insulation, the potential of icebergs for generating electric power, and the economics of such a venture are discussed. Prince Mohammed al-Faisal of Saudi Arabia is committed to backing the necessary research, and is dedicated to the idea that iceberg water can be practical, not only for the Middle East but for Australia, California, Chile and other developing countries as well. Prince Faisal has formed a group called Iceberg Technology International, headquartered in Paris, to pursue his goal.

33-779

Thermal fields of the inland and peripheral seas of the USSR (observation and interpretation of two-dimensional inhomogeneities). (Teplovyie polia vnutrennikh i okrainnykh morei SSSR (Sostoiannie nabludenii i teorii interpretatsii dvumernykh neodnorodnostei)).

Liubimova, E.A., et al, Moscow, Nauka, 1976, 224p., In Russian with English table of contents enclosed. Refs. p.218-222.

Nikitina, V.N., Tomara, G.A.

Water transport, Heat flux, Ocean currents, Ice conditions, Drift stations, Ocean bottom, Geothermometry, Bottom topography, Bottom sediment, Temperature distribution, Analysis (mathematics), Arctic Ocean, Okhotsk Sea, USSR—Baykal Lake.

33-780

Air heaters for construction purposes. (Stroitel'nye vozdukhonagrevately).

Postnov, M.T., Moscow, Strofizdat, 1977, 113p., In Russian with English table of contents enclosed. 10 refs.

Cold weather construction, Residential buildings, Industrial buildings, Drying, Electric heating, Concrete heating, Construction equipment.

33-781

Thermal calculation of multilayered hydraulic structures. (Teplovyie raschety mnogosloynnykh konstruktivnykh gidrosooruzhenii).

Pliat, Sh.N., Moscow, Energiia, 1978, 199p., In Russian with English table of contents enclosed. 39 refs.

Hydraulic structures, Hydroelectric power generation, Concrete structures, Dams, Thermal regime, Foundations, Heat transfer, Thermal conductivity, Analysis (mathematics).

33-782

Calculating settlement and strength of foundations of buildings and structures. (Raschety osakov i prochnosti osnovanii zdanii i sooruzhenii).

Gol'dshteln, M.N., et al, Kiev, Budivelnik, 1977, 208p., In Russian with English table of contents enclosed. 94 refs.

Kushner, S.G., Shevchenko, M.I.

Buildings, Concrete structures, Foundations, Footings, Clays, Sands, Bearing strength, Settlement (structural), Design, Deformation.

33-783

Construction of an industrial complex (the steel wheel production plant in Vyks). (Vozvedenie promyshlennogo kompleksa (na primere stroitel'stva kolesoprokatnogo kompleksa v g. Vykse)).

Zil'berg, S.D., Moscow, Strofizdat, 1977, 79p., In Russian with English table of contents enclosed. 10 refs.

Cold weather construction, Industrial buildings, Foundations, Reinforced concrete, Winter concreting, Earthwork, Hydraulic fill, Soil freezing, Concrete heating, Concrete admixtures, Peat, Swamps.

33-784

Designing optimal nonrigid pavements. (Proektirovanie optimal'nykh nezhestkikh dorozhnykh odezhd).

Tulaev, A.I.A., ed, Moscow, Transport, 1977, 117p., In Russian with English table of contents enclosed. 24 refs.

Roads, Pavements, Frost heave, Thermal insulation, Design, Computer applications.

33-785

Environmental assessment of the Alaskan continental shelf, Vol.2. Boulder, Colorado, Environmental Research Laboratories, 1977, 604p., Principal investigators' reports October-December 1977. For selected individual reports see 33-786 through 33-804.

Oil spills, Sea ice, Oceanography, Remote sensing, Meteorology, Sediments.

33-786

Development and operation of HF ocean current mapping radar units.

Barrick, D.E., Environmental assessment of the Alaskan continental shelf. Vol.2. Principal investigators' quarterly reports for the period October-December 1977, Boulder, Colorado, Environmental Research Laboratories, 1978, p.7-27.

Surface waters, Radar, Mapping, Flow rate.

33-787

Coastal morphology, oil spill vulnerability and sedimentology, northern Gulf of Alaska.

Hayes, M.O., et al, Environmental assessment of the Alaskan continental shelf. Vol.2. Principal investigators' quarterly reports for the period October-December 1977, Boulder, Colorado, Environmental Research Laboratories, 1978, p.28-50, 27 refs.

Ruby, C.H.

Sediment transport, Oil spills, Shores, Marine biology.

33-788

Reconnaissance evaluation of longshore sediment transport, northeast Gulf of Alaska.

Nummedal, D., et al, Environmental assessment of the Alaskan continental shelf. Vol.2. Principal investigators' quarterly reports for the period October-December 1977, Boulder, Colorado, Environmental Research Laboratories, 1978, p.51-62, 12 refs.

Stephen, M.F., Ruby, C.H.

Sediment transport, Aerial reconnaissance, Geomorphology.

33-789

Gulf of Alaska study of mesoscale oceanographic processes (Gac-Mop).

Hayes, S.P., et al, Environmental assessment of the Alaskan continental shelf. Vol.2. Principal investigators' quarterly reports for the period October-December 1977, Boulder, Colorado, Environmental Research Laboratories, 1978, p.77-121.

Schumacher, J.D.

Cold weather tests, Oceanographic surveys, Suspended sediments, Hydrography.

33-790

Bristol Bay oceanographic processes.

Coachman, L.K., et al, Environmental assessment of the Alaskan continental shelf. Vol.2. Principal investigators' quarterly reports for the period October-December 1977, Boulder, Colorado, Environmental Research Laboratories, 1978, p.125-136.

Kinde, T.H., Schumacher, J.D., Charnell, R.L.

Oceanographic surveys, Physical properties, Hydrography, Chemical properties.

- 33-791  
Study of climatic effects on ice extent and its seasonal decay along the Beaufort Sea and the Chukchi Sea coasts.  
Barry, R.G., Environmental assessment of the Alaskan continental shelf. Vol.2. Principal investigators' quarterly reports for the period October-December 1977, Boulder, Colorado, Environmental Research Laboratories, 1978, p.141-171, 11 refs.  
Mapping, Ice conditions, Climatic factors, Wind factors, Pack ice, Fast ice.
- 33-792  
Circulation and water masses in the Gulf of Alaska.  
Royer, T.C., Environmental assessment of the Alaskan continental shelf. Vol.2. Principal investigators' quarterly reports for the period October-December 1977, Boulder, Colorado, Environmental Research Laboratories, 1978, p.188-191.  
Periodic variations, Precipitation (meteorology), Atmospheric circulation, Wind (meteorology).
- 33-793  
Sediment characteristics, stability, and origin of the barrier island-lagoon complex, North Arctic Alaska.  
Naidu, A.S., Environmental assessment of the Alaskan continental shelf. Vol.2. Principal investigators' quarterly reports for the period October-December 1977, Boulder, Colorado, Environmental Research Laboratories, 1978, p.219-230, 5 refs.  
Sediment transport, Clay minerals, Statistical data, Grain size, Chemical analysis.
- 33-794  
Environmental geology and geomorphology of the barrier island-lagoon system along the Beaufort Sea coastal plain from Prudhoe Bay to the Colville River.  
Cannon, P.J., Environmental assessment of the Alaskan continental shelf. Vol.2. Principal investigators' quarterly reports for the period October-December 1977, Boulder, Colorado, Environmental Research Laboratories, 1978, p.231-241.  
Geomorphology, Erosion, Aerial reconnaissance, Geology.
- 33-795  
Oceanographic processes in a Beaufort Sea barrier island-lagoon system.  
Mungall, J.C.H., Environmental assessment of the Alaskan continental shelf. Vol.2. Principal investigators' quarterly reports for the period October-December 1977, Boulder, Colorado, Environmental Research Laboratories, 1978, p.242-246, 1 ref.  
Hydrography, Ecology, Oceanographic surveys, Flow rate, Models.
- 33-796  
Oil spill vulnerability of the Beaufort Sea coast.  
Nummedal, D., et al, Environmental assessment of the Alaskan continental shelf. Vol.2. Principal investigators' quarterly reports for the period October-December 1977, Boulder, Colorado, Environmental Research Laboratories, 1978, p.250-279, 4 refs.  
Fischer, I.A., Knoth, J.S.  
Sampling, Oil spills, Aerial reconnaissance, Sediment transport, Geomorphology, Statistical data.
- 33-797  
Dynamics of near shore ice.  
Pritchard, R.S., Environmental assessment of the Alaskan continental shelf. Vol.2. Principal investigators' quarterly reports for the period October-December 1977, Boulder, Colorado, Environmental Research Laboratories, 1978, p.289-315, Includes Measurements of sea ice motion January 1977 to September 1977 by A.S. Thorndyke. 3 refs.  
Sea ice, Ice surveys, Drift, Buoys.
- 33-798  
Geologic processes and hazards of the Beaufort Sea shelf and coastal regions.  
Barnes, P., et al, Environmental assessment of the Alaskan continental shelf. Vol.2. Principal investigators' quarterly reports for the period October-December 1977, Boulder, Colorado, Environmental Research Laboratories, 1978, p.321-352, Includes Salinity of interstitial water of sea floor sediments, Beaufort Sea shelf by Reimnitz and D. Maurer; Sea floor temperatures, Beaufort Sea, Alaska by Barnes, and Reimnitz; and Morphologic character of the "2-m bench"—Colville River delta by L. Toimil. 14 refs.  
Reimnitz, E.  
Bottom sediment, Salinity, Temperature gradients, Estuaries, Sea ice, Suspended sediments, Submarine permafrost.
- 33-799  
Faulting, instability, erosion and deposition of shelf sediments eastern Gulf of Alaska.  
Carlson, P.R., et al, Environmental assessment of the Alaskan continental shelf. Vol.2. Principal investigators' quarterly reports for the period October-December 1977, Boulder, Colorado, Environmental Research Laboratories, 1978, p.369-388, 43 refs.  
Molnia, B.F.  
Bottom sediment, Mapping, Geological maps, Seismic surveys.
- 33-800  
Seismic and volcanic risk studies—western Gulf of Alaska.  
Pulpan, H., et al, Environmental assessment of the Alaskan continental shelf. Vol.2. Principal investigators' quarterly reports for the period October-December 1977, Boulder, Colorado, Environmental Research Laboratories, 1978, p.389-421.  
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Seismic surveys, Volcanoes.
- 33-801  
Subsea permafrost: probing, thermal regime and data analysis.  
Osterkamp, T.E., et al, Environmental assessment of the Alaskan continental shelf. Vol.2. Principal investigators' quarterly reports for the period October-December 1977, Boulder, Colorado, Environmental Research Laboratories, 1978, p.422-425.  
Harrison, W.D.  
Submarine permafrost, Artificial islands, Temperature measurement.
- 33-802  
Bottom and near-bottom sediment dynamics in Norton Basin.  
Cacchione, D.A., et al, Environmental assessment of the Alaskan continental shelf. Vol.2. Principal investigators' quarterly reports for the period October-December 1977, Boulder, Colorado, Environmental Research Laboratories, 1978, p.449-461.  
Drake, D.E.  
Bottom sediment, Suspended sediments.
- 33-803  
Shoreline history of Chukchi and Beaufort Seas as an aid to predicting offshore permafrost conditions.  
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Coastal topographic features, Submarine permafrost, Geomorphology.
- 33-804  
Geographic based information management system for permafrost in the Beaufort and Chukchi Seas.  
Vigdorchik, M., Environmental assessment of the Alaskan continental shelf. Vol.2. Principal investigators' quarterly reports for the period October-December 1977, Boulder, Colorado, Environmental Research Laboratories, 1978, p.474-568.  
Submarine permafrost, Temperature measurement, Salinity, Data processing.
- 33-805  
Geology and ground water for land-use planning in the Eagle River-Chugliak area, Alaska.  
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- 33-806  
Map showing depth to water Anchorage area, Alaska.  
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Water table, Maps, United States—Alaska.
- 33-807  
Water-table contour map, Anchorage Area, Alaska.  
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- 33-808  
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Telemetering equipment, Radioactive snow gages, Specifications, Profiles, Computer programs.
- 33-809  
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- 33-810  
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Müller, A., Iowa. University. Iowa Institute of Hydraulic Research. Report, June 1978, No.214, MP 226, 93p., 42 refs. Sponsored by U.S. Army Cold Regions Research and Engineering Laboratory.  
Turbulent flow, Ice growth, Ice nuclei, Frazil ice, Experimental data.
- 33-811  
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Fog, Psychrometers, Water vapor, Atmospheric electricity, Radon.
- 33-812  
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Research projects, Air cushion vehicles, Sea ice, Amphibious vehicles, Design, Development.
- 33-813  
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- 33-814  
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Permafrost structure, Ground ice, Remote sensing, Infrared mapping, Mathematical models.
- 33-815  
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- 33-816  
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Bottom sediment, Permafrost distribution, Thermal regime, Permafrost thickness, Submarine permafrost, Permafrost thermal properties, Permafrost thermal cycles, USSR—Yenisey River, USSR—East Siberian Sea.

- 33-818**  
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Submarine permafrost, Permafrost thermal cycles, Bottom sediment, Thermal regime, USSR—East Siberian Sea.
- 33-819**  
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Permafrost distribution, Thermal regime, Geothermy, Permafrost thickness, Permafrost thermal properties, USSR—Yenisey River, USSR—Khatanga River.
- 33-820**  
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- 33-822**  
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- 33-824**  
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- 33-825**  
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- 33-826**  
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- 33-827**  
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- 33-828**  
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A seismic reflection survey with a TRIO SX 12, a seismic refraction equipment for civil engineering, gives the topography of the bedrock under 100 to 650 m of Ampère Glacier, Kerguelen Is. With geophones placed in an hexagonal pattern, each shot gives 2 independent reflecting elements. A simple method to calculate errors on each of the 3 coordinates of each mirrorpoint is given. The velocity of P-wave is 3730 m/s parallel to the surface of the glacier, a little faster for an angle of incidence of 45 deg, a little slower for the other orientations. There is no intermediate layer between the ice and the bedrock. Depths reach 200 m under sea level at 6 km of the snout.
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Mass balance and recent fluctuations of Ampère Glacier (Kerguelen Islands, T.A.A.F.). (Bilan de masse et fluctuations récentes du Glacier Ampère (Îles Kerguelen, T.A.A.F.)).  
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From 1970 to 1974 the equilibrium line of Ampère Glacier, Kerguelen Is., was near 700 m a.s.l., the ablation gradient being 0.02 m w.e./m. During these four years the tongue had been thinning from 2 to 5 m each year. From 1962 to 1974 the snout receded about 25 to 50 m each year, and it is possible that the recession had been going on since 1910. In the accumulation area, between 450 and 1050 m a.s.l., the mean balance is 1.9 m of ice/year.
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This paper presents the results of energy balance studies of two stations at Ampère Glacier, Kerguelen Is. Linear regressions have been established for the data of the two stations (temperature, vapor pressure, their vertical gradients, net radiation and friction velocity). The wind profiles of the lowest 4 m become logarithmic if a certain displacement height of the instruments is allowed for. The values of friction velocity are closely dependent on this displacement height and on wind direction. Energy fluxes are expressed in terms of wind speed, temperatures and vapor pressure at one level.
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- 33-889**  
Measurements of ice and firn temperatures on Hintereisferner. (Messungen von Eis- und Firntemperaturen am Hintereisferner (Ötztal Alpen)).  
Markl, G., et al., *Zeitschrift für Gletscherkunde und Glazialgeologie*, 1977 (Pub. 1978), 13(1/2), p.261-265, In German with English summary. 9 refs.  
Wagner, H.P.  
Glacier ice, Ice temperature, Firn, Temperature variations.
- 33-890**  
New instrument for the rapid crystallographic analysis of ice thin sections.  
Lile, R.C., *Zeitschrift für Gletscherkunde und Glazialgeologie*, 1977 (Pub. 1978), 13(1/2), p.267-273, In English with German summary. 6 refs.  
Ice crystal structure, Ice crystal optics, Thin sections, Measuring instruments.
- 33-891**  
Electronic measurements with pulsed echo in glaciology. (Elektronische Messungen mit Puls-Echo in der Glaziologie).  
Fritzsche, W., et al., *Zeitschrift für Gletscherkunde und Glazialgeologie*, 1977 (Pub. 1978), 13(1/2), p.275-283, In German with English summary. 5 refs.  
Ostere, F.  
Echo sounding, Radar echoes, Glacier surveys, Crevasse detection, Snow depth, Measuring instruments.
- 33-892**  
Eighteenth Soviet Antarctic Expedition. Seasonal research 1972/73. General description. (Vosemnadtsataya sovetskaya antarkticheskaya ekspeditsiya. Sezonnaya issledovaniya 1972/73. g. Obshchee opisanie).  
Sovetskaya antarkticheskaya ekspeditsiya, *Sovetskaya antarkticheskaya ekspeditsiya. Trudy*, 1978, Vol.68, p.1-70, In Russian.  
Sen'ko, P.K., ed.  
Research projects, Glaciology, Ships, Antarctica, Sea ice.  
This overview of the 18th SAE is divided into three sections. First, administrative and logistic aspects of the expedition are described. Then scientific efforts based on board the Ob' and the Professor Zubov, such as aerometeorological study, satellite observations, ice studies, oceanographic research and vessel hull vibration investigations, are summarized. The third section is devoted to land-based scientific operations such as glaciological field work, botanical studies around Bellingshausen Station, and airfield construction at Molodezhnaya.
- 33-893**  
Ice conditions encountered by the d/e Ob' (1972/73). (Ledovye uslovia plavaniia d/e Ob' (1972/73 g.)).  
Leont'ev, E.B., et al., *Sovetskaya antarkticheskaya ekspeditsiya. Trudy*, 1978, Vol.68, p.71-78, In Russian.  
Komova, V.V.  
Ice conditions, Sea ice distribution, Antarctica.  
A detailed description of ice conditions along approaches to Mirnyy, Molodezhnaya, and Leningradskaya Stations and to the construction site of the new Soviet station in March and April 1973, as well as of drift conditions encountered by the Ob' is given. It is based on data from aerial reconnaissance, satellites and visual observations.
- 33-894**  
Ice conditions encountered by the research vessel Professor Zubov (Dec. 1972-Mar. 1973). (Ledovye uslovia plavaniia nauchno-issledovatel'skogo sudna Professor Zubov (dekabr' 1972 g.—mart 1973 g.)).  
Denisov, A.S., *Sovetskaya antarkticheskaya ekspeditsiya. Trudy*, 1978, Vol.68, p.79-86, In Russian. 12 refs.  
Ice conditions, Pack ice, Sea ice distribution, Icebergs, Antarctica.  
Ice conditions encountered by the Professor Zubov are described for the following routes: Montevideo-Bellingshausen-Molodezhnaya-Freemantle; Freemantle-Mirnyy-Kerguelen; Freemantle-Mirnyy-Amery camp; Amery camp-Molodezh-

naya-Africa. Several conclusions on iceberg and pack distribution are drawn from the data.

33-895

Features of the formation of the Balleny ice massif and drift of the Ob'. (Nekotorye zakonomernosti formirovaniia Ballenskogo ledianogo massiva i drev' d/e Ob').

Romanov, A.A., *Sovetskaya antarkticheskaya ekspeditsiya. Trudy*, 1978, Vol.68, p.87-95, In Russian. 6 refs.

Sea ice, Pack ice, Drift.

The Ob' was icebound from Apr. 23 until July 22, 1972, near the Balleny Islands and forced to drift in the area of the so-called Balleny Ice Massif. She drifted altogether 564 miles at a rate of 0.26 knots. Added to other available data, the observations resulting from this situation allowed several conclusions to be drawn about ice formation in the region. The best time to approach Leningradskaya Station is late January or February. The route should be chosen based on the current position of the Balleny Massif.

33-896

Results of navigability trials of antarctic ice by the Ob'. (Nekotorye rezul'taty ispytaniil khodkosti d/e Ob' v antarkticheskikh l'dakh), Kudishkin, V.S., et al, *Sovetskaya antarkticheskaya ekspeditsiya. Trudy*, 1978, Vol.68, p.96-99, In Russian. Leont'ev, E.B.

Ships, Ice cover strength, Ice cover thickness, Pack ice, Sea ice, Ice navigation, Antarctica.

Instrument readings on various characteristics of ice and on speed of the Ob' in antarctic waters are used to assess the effectiveness of vessels of her type for resupply missions and other work in summer pack and drifting ice.

33-897

Features of the oceanographic regime in Prydz Bay (Feb. 1973). (Osobennosti gidrologicheskogo rezhima v zalive Priuda (fevral' 1973 g.)).

Denisov, A.S., et al, *Sovetskaya antarkticheskaya ekspeditsiya. Trudy*, 1978, Vol.68, p.100-105, In Russian. 6 refs.

Myznikova, M.N.

Ice conditions, Sea ice distribution, Antarctica—Prydz Bay.

Ice and oceanological conditions in the Prydz Bay in February 1973 were studied by the Professor Zubov. Sea ice distribution, chemistry, temperature, salinity, and circulation of the water in the bay are analyzed.

33-898

Movement of the ice sheet around Mirny Station. (O dvizhenii lednikovogo pokrova v ralone stantsii Mirny).

Ivanov, I.P., *Sovetskaya antarkticheskaya ekspeditsiya. Trudy*, 1978, Vol.68, p.113-114, In Russian. 3 refs.

Glacier movement, Glacier flow, Ice deformation, Lasers, Antarctica—Mirny Station.

The Doppler-effect method using lasers was employed to study flow and deformation of the ice cover around Mirny Station. At more than 20 points, average hourly, average per-minute and momentary flow rates were recorded and the nature of glacier movement in the Vetrov Hill area was analyzed. Average hourly rates range from 0.0 to 1.2 microns/sec.

33-899

Antarctic ice sheet deformation. (K voprosu o deformatsii antarkticheskogo lednikovogo pokrova), Ivanov, I.P., et al, *Sovetskaya antarkticheskaya ekspeditsiya. Trudy*, 1978, Vol.68, p.115-116, In Russian.

Firsov, N.T., Chudakov, V.I.

Ice deformation, Glacier ice, Glacier movement, Antarctica—Wilkes Land.

Ice sheet deformation was studied in locations along a Mirny-Vostok traverse. In areas with many crevasses glacier deformation resembles the vibration of springs with amplitudes of 3-10 microns on a 10 m base. Maximum deformation in crevasse free areas does not exceed 0.4 microns.

33-900

Studies of antarctic glacier structure. (Rezultaty issledovaniia stroeniia antarkticheskogo lednika).

Trepov, G.V., *Sovetskaya antarkticheskaya ekspeditsiya. Trudy*, 1978, Vol.68, p.117-121, In Russian.

Glacier beds, Glaciers, Radio echo soundings, Antarctica—Hays Glacier, Antarctica—Molodezhnaya Station.

Radio echo sounding of the antarctic ice sheet in the Hays Glacier region permitted study of the internal structure of the glacier and the diagramming of the glacier bed.

33-901

Geomagnetic measurement within a glaciological polygon. (Geomagnitnye izmereniia na gliatsiologicheskoi poligone).

Burisev, I.U.A., *Sovetskaya antarkticheskaya ekspeditsiya. Trudy*, 1978, Vol.68, p.122-124, In Russian.

Glacier movement, Geomagnetism, Antarctica—Wilkes Land.

The 18th Soviet Antarctic Expedition marked the beginning of a magnetic study of glacier flow velocity and direction. A geo-

magnetic polygon was laid out 353 km from Mirny on the route to Vostok and was defined by the right-angle intersection of two traverse routes. The chosen area is suitable for study but in order to improve the accuracy of this method, the cross-shaped polygon should be replaced by a right-angle network of traverse routes.

33-902

Radio echo soundings within glaciological polygons. (Rezultaty radiolokatsionnoi s'emki na gliatsiologicheskikh poligonakh).

Chudakov, V.I., *Sovetskaya antarkticheskaya ekspeditsiya. Trudy*, 1978, Vol.68, p.125-129, In Russian.

Radio echo soundings, Glacier thickness, Glacier beds, Antarctica.

In 1973 a glaciological field party measured glacier thickness along the Mirny-Vostok traverse and completed barometric leveling of its surface as far as the 357th km. A second area survey was done in polygon No.2, where the glacier thickness ranges from 1810 to 2350m, whereas in No.3 it goes from 1630 to 2670m. Surface height is 1810m in No.2 and 2860m in No.3.

33-903

Resonant hull vibrations of the Ob' when traversing ice cake. (Rezonansnye kolebaniia korpusa d/e Ob' pri dvizhenii v melkobitykh l'dakh).

Kudishkin, V.S., *Sovetskaya antarkticheskaya ekspeditsiya. Trudy*, 1978, Vol.68, p.130-132, In Russian. 2 refs.

Ships, Sea ice, Ice navigation, Vibration.

Hull vibrations of the Ob' are studied during its passage through antarctic ice cake at various speeds. Experimental data are presented on frequency and amplitude of hull vibrations in the resonance range. Desirable (supercritical) speeds are recommended.

33-904

Interaction of the hull of the Ob' with compressed ice. (Osobennosti vzaimodelstviia korpusa d/e Ob' so l'dom pri szhatiakh).

Kudishkin, V.S., et al, *Sovetskaya antarkticheskaya ekspeditsiya. Trudy*, 1978, Vol.68, p.133-139, In Russian. 2 refs.

Kosenko, N.G.

Ice pressure, Compressive strength, Ice navigation, Ships.

The Ob' sustained extensive damage to parts of her hull when she was icebound for 90 days off the Oates Coast. The authors analyze the stress to which she was subject from floating ice, various wind and other weather conditions, and during her entrapment.

33-905

Experimental work on ice vibration in the Ob'. (Eksperimental'noe izuchenie ledovoi vibratsii d/e Ob').

Kudishkin, V.S., *Sovetskaya antarkticheskaya ekspeditsiya. Trudy*, 1978, Vol.68, p.140-143, In Russian. 5 refs.

Ships, Vibration, Ice navigation, Ice pressure.

A method for studying hull vibration under ice conditions has been worked out. The initial results of the application of the method to vibration in the Ob' hull in antarctic ice are presented.

33-906

Arctic sea ice.

World Data Center A for Glaciology, *Glaciological data*, 1978, GD-2, 262p., Refs. passim. For individual articles see 32-2291 and 33-907 through 33-913.

Sea ice distribution, Ice conditions, Terminology, Bibliographies, Ice reporting.

33-907

Fast ice terminology.

Stringer, W.J., *Glaciological data*, 1978, GD-2, p.21-23, 9 refs.

Fast ice, Terminology, Ice conditions.

33-908

Arctic Ice Dynamics Joint Experiment.

Untersteiner, N., *Glaciological data*, 1978, GD-2, p.25-32, 4 refs.

Ice mechanics, Ice physics, Sea ice, Research projects, Meteorological data, AIDJEX, Models, Computer applications.

33-909

Sea ice observations by NOAA's National Environmental Satellite Service.

McClain, E.P., *Glaciological data*, 1978, GD-2, p.33-42, 22 refs.

Sea ice distribution, Infrared reconnaissance, Remote sensing, Spacecraft, Mapping.

33-910

U.S. Navy global ice analysis and forecasting.

O'Leary, E.A., *Glaciological data*, 1978, GD-2, p.43-46, 11 refs.

Sea ice distribution, Ice conditions, Ice forecasting, Remote sensing, Icebergs, Seasonal variations, Spacecraft.

Since 1972 the U.S. Fleet Weather Facility Ice Operations Department has produced global sea ice analyses and forecasts on

a year-round basis. The data summarized in these analyses provide useful information for planning Antarctic operations. The products and some applications are: 1. detailed "tailored" analyses and forecasts for close support of ships in the polar pack; 2. routine weekly analyses which indicate the existing trends in ice growth or recession. These also serve as bases for long-range forecasts and climatological summaries; 3. 15- and 30-day forecasts, used to update seasonal forecasts; and 4. seasonal outlook in the Ross Sea, indicating the expected rates and patterns of breakup and the expected dates for safe transit to McMurdo or the Ross Ice Shelf. (Auth.)

33-911

Canadian Government ice services.

Sowden, W.J., *Glaciological data*, 1978, GD-2, p.47-48.

Ice conditions, Ice forecasting, Ice surveys, Canada.

33-912

Data set on Northern Hemisphere sea ice extent, 1953-76.

Walsh, J.E., *Glaciological data*, 1978, GD-2, p.49-51, 12 refs.

Sea ice distribution, Mapping, Data processing.

33-913

Arctic sea ice: a selected bibliography, 1965-77. *Glaciological data*, 1978, GD-2, p.53-105, 129-239, Numerous refs.

Bibliographies, Sea ice, Drift, Freezeup, Ice breakup, Ice water interface, Remote sensing, Ice forecasting, Ice air interface.

33-914

Geometrical levelling over the Greenland icecap by Levelling Group A of the Greenland International Glaciological Expedition 1967-68. Summer season 1968. (Das geometrische Nivellement über das grönländische Inlandeis der Gruppe Nivellement A der Internationalen Glaziologischen Grönland Expedition 1967-68. Sommercampagne 1968).

Seckel, H., Denmark. Kommissionen for videnskabelige undersøgelser i Grønland. Meddelelser om Grønland, 1977, 187(3), Expedition glaciologique internationale au Groenland. E.G.I.G. 1967-1968, 3(3), 86p., In German with English and French summaries. 11 refs.

Geodetic surveys, Ice sheets, Height finding, Traverses.

33-915

Altitude variations in the Greenland icecap between 1959 and 1968. (Höhenänderungen im grönländischen Inlandeis zwischen 1959 und 1968).

Seckel, H., Denmark. Kommissionen for videnskabelige undersøgelser i Grønland. Meddelelser om Grønland, 1974, 187(4), Expedition glaciologique internationale au Groenland. E.G.I.G. 1967-1968, 3(5), 58p., In German with English and French summaries. 8 refs.

Ice sheets, Geodetic surveys, Height finding, Ice creep.

33-916

Investigations of energy exchange in the accumulation zone of the Greenland icecap. (Untersuchungen zum Energieumsatz in der Akkumulationszone des grönländischen Inlandeis).

Ambach, W., Denmark. Kommissionen for videnskabelige undersøgelser i Grønland. Meddelelser om Grønland, 1977, 187(7), Expedition glaciologique internationale au Groenland. E.G.I.G. 1967-1968, 4(7), 45p., In German with English and French summaries. 16 refs.

Ice sheets, Snow cover, Snow accumulation, Heat flux, Heat balance, Snow water content, Snow temperature.

33-917

Investigations of the energy exchange in the ablation zone of the Greenland icecap: supplement. (Untersuchungen zum Energieumsatz in der Ablationszone des grönländischen Inlandeis: Nachtrag).

Ambach, W., Denmark. Kommissionen for videnskabelige undersøgelser i Grønland. Meddelelser om Grønland, 1977, 187(5), Expedition glaciologique internationale au Groenland. E.G.I.G. 1967-1968, 4(5), 64p., In German with English and French summaries. 11 refs.

Ice sheets, Radiation balance, Seasonal ablation, Air temperature, Wind factors.

33-918

Economical and effective deicing agents for use on highway structures.

Boies, D.B., et al, *National Cooperative Highway Research Program. Report*, 1965, No.19, 19p., 21 refs.

Bortz, S.

Deicers, Chemical ice prevention, Concrete pavements, Freeze thaw cycles, Chemical reagents, Corrosion.

- 33-919  
Liquid instability and freezing. 2. Multi-mode one dimensional analysis of a nonlinear diffusion equation. Munakata, T., *Physical Society of Japan. Journal*, Sep. 1978, 45(3); p.749-757, 27 refs. For Part 1 see 32-1633.
- 33-920  
Liquids, Freezing, Ice crystals, Analysis (mathematics).
- 33-920  
Buckling of half ice sheet against a cylinder. Wang, Y.-S., *American Society of Civil Engineers. Engineering Mechanics Division. Journal*, Oct. 1978, 104(EM5), p.1131-1145, 8 refs.
- 33-921  
Pack ice, Flexural strength, Ice pressure, Offshore structures, Analysis (mathematics).
- 33-921  
Freezing-melting heat transfer in a tube flow. Yim, A., et al., *International journal of heat and mass transfer*, Sep. 1978, 21(9), p.1185-1196, In English with French, German, and Russian summaries. 19 refs.
- 33-922  
Heat transfer, Ice melting, Pipes (tubes), Turbulent flow, Gases.
- 33-922  
Numerical calculation of glacier flow by finite element methods. Raymond, C.F., Seattle, University of Washington, (1978), c220p.
- 33-923  
Computer programs, Glacier flow, Ice mechanics, Ice creep, Ice deformation, Mathematical models.
- 33-923  
Analysis of sensible and latent heat flow in a partially frozen unsaturated soil. Fuchs, M., et al., *Soil Science Society of America. Journal*, May-June 1978, 42(3), p.379-385, 15 refs.
- 33-924  
Campbell, G.S., Papendick, R.I.
- 33-924  
Heat flux, Frozen ground thermodynamics, Heat capacity, Thermal conductivity.
- 33-924  
Water redistribution in partially frozen, saturated silt under several temperature gradients and overburden loads. Loch, J.P.G., et al., *Soil Science Society of America. Journal*, May-June 1978, 42(3), p.400-406, 17 refs.
- 33-925  
Kay, B.D.
- 33-925  
Soil moisture migration, Frozen ground mechanics, Frost heave, Ice lenses, Soil pressure.
- 33-925  
Surface water records of Cook Inlet Basin, Alaska, through September 1975. Scully, D.R., et al., *U.S. Geological Survey. Open-file report*, 1978, 78-498, 102p.
- 33-926  
Leveen, L.S., George, R.S.
- 33-926  
Water supply, Natural resources, Stream flow, Water temperature.
- 33-926  
Built-up hydraulic structures (fundamentals of design). (Namyvnye gidrotekhnicheskie sooruzheniia (osnovy rascheta i proektirovaniia)), Melent'ev, V.A., et al., Moscow, Energiia, 1973, 247p. (Pertinent p.49-72). In Russian. 188 refs.
- 33-927  
Kolpashnikov, N.P., Volnin, B.A.
- 33-927  
DLC TA750.M42
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Hydraulic structures, Earth dams, Cold weather construction, Permafrost beneath structures, Thermal regime, Design.
- 33-927  
Soil formation and weathering in humid landscapes. (Pochvoobrazovanie i vyvetrivanie v gumidnykh landshtakh), Targul'ian, V.O., ed., Moscow, Nauka, 1978, 211p., In Russian with English summaries. For selected papers see 33-928 and 33-929. Refs. passim.
- 33-928  
Taiga soils, Taiga vegetation, Soil formation, Peat, Podsol, Swamps, Soil chemistry, Soil composition, Soil profiles.
- 33-928  
Origin and evolution of the second humus zone in the south taiga soils of West Siberia. (Genezis i evoliutsiia vtorogo gumusovogo gorizonta v pochvakh iuzhnoi talgi Zapadnoi Sibiri), Karavaeva, N.A., Pochvoobrazovanie i vyvetrivanie v gumidnykh landshtakh (Soil formation and weathering in humid landscapes), Moscow, Nauka, 1978, p.133-157, In Russian with English summary. Refs. p.156-157.
- 33-929  
Soil formation, Taiga soils, Taiga vegetation, Soil composition, Soil profiles, Podsol.
- 33-929  
Recent swamping of the south taiga soils in West Siberia and the evolution of soil cover in the Holocene. (Sovremennoe zabolachivanie v pochvakh iuzhnoi talgi Zapadnoi Sibiri i evoliutsiia pochvennogo pokrova v golotsene), Karavaeva, N.A., Pochvoobrazovanie i vyvetrivanie v gumidnykh landshtakh (Soil formation and weathering in humid landscapes), Moscow, Nauka, 1978, p.158-210, In Russian with English summary. Refs. p.209-210.
- 33-930  
Swamps, Taiga soils, Taiga vegetation, Soil formation, Peat, Soil profiles, Soil chemistry.
- 33-930  
Possibilities of using photoelastic sensors for measuring stresses in perennially frozen rocks. (Otsenka vozmozhnosti izmereniia napriazhenii fotouprugimi datchikami v usloviakh mnogoletnei merzloty), Senuk, D.P., Izmerenie napriazhenii v massive gornyykh porod. Materialy V Vsesoiuznogo seminar, Novosibirsk, 1-3 iulia, 1975. Chast' 1. (Measuring stresses in massive rocks. Proceedings of the 5th All-Union seminar, Novosibirsk, July 1-3, 1975. Vol.1), Novosibirsk, 1976, p.49-51, In Russian. 7 refs.
- 33-931  
DLC TA706.5.194
- 33-931  
Mining, Permafrost, Shafts (excavations), Thermal stresses, Measuring instruments.
- 33-931  
Studying overloading regimes of excavating equipment for frozen ground. (Issledovanie peregruzochnykh rezhimov zemlerolnykh mashin dlia merzlykh gruntov), Solomono, S.A., Moscow, Moskovskii institut inzhenerov zheleznodorozhnogo transporta. Trudy, 1977, Vol.559, p.41-47, In Russian.
- 33-932  
Earthwork, Excavating equipment, Frozen ground.
- 33-932  
Prospects for using the block-replacement method of repairing construction equipment for the Baykal Amur railroad. (Perspektivy primeneniia agregatno-uzlovogo metoda remonta stroitel'nykh mashin v usloviakh BAMa), Alferov, A.K., et al., Moscow, Moskovskii institut inzhenerov zheleznodorozhnogo transporta. Trudy, 1977, Vol.559, p.72-78, In Russian.
- 33-933  
Kochnev, E.B.
- 33-933  
Construction equipment, Cold weather performance, Winter maintenance, Baykal Amur railroad.
- 33-933  
Influence of concrete temperature and humidity on strength and deformation. (Vliianie temperatury i vlazhnosti betona na ego deformativnost' i prochnost'), Aktuganov, I.Z., et al., Novosibirsk. Institut inzhenerov zheleznodorozhnogo transporta. Trudy, 1976, Vol.175, p.47-50, In Russian. 3 refs.
- 33-934  
Boiazitov, R.K., Moskalov, V.V.
- 33-934  
Concrete, Concrete strength, Low temperature tests, Deformation.
- 33-934  
Studying creep and settlement of concrete in piers of a Noril'skaya River bridge. (Issledovanie usadki i polzuchesti betona opor mosta cherez r. Noril'skuiu), Snisar, V.Kh., Novosibirsk. Institut inzhenerov zheleznodorozhnogo transporta. Trudy, 1976, Vol.175, p.51-63, In Russian. 4 refs.
- 33-935  
Bridges, Permafrost beneath structures, Concrete structures, Concrete durability, Creep properties, Settlement (structural).
- 33-935  
Controlling the diameter of vertical open holes made by blasting plastic frozen ground for pile sinking. (Kontrol' diametrov vertikal'nykh otkrytykh polostei, obrazuemykh energiei vzryva v plastichnomerzlykh gruntakh dlia opusknnykh svai), Ul'chich, I.A., Osnovaniia i fundamenti, 1978, Vol.11, p.88-89, In Russian.
- 33-936  
Concrete piles, Earthwork, Blasting, Frozen ground.
- 33-936  
Criteria for evaluating different aspects of effectiveness of landslide control structures and measures. (O kriteriiakh otsenki razlichnykh vidov effektivnosti protivopoloznykh sooruzhenii i meropriatii), Khazin, V.I., et al., Osnovaniia i fundamenti, 1978, Vol.11, p.90-93, In Russian. 9 refs.
- 33-937  
Bondar, E.G., Golub, V.P.
- 33-937  
Slope processes, Landslides, Slope stability, Landslide control, Countermeasures, Structures.
- 33-937  
Documents of the 15th meeting. Scientific Committee on Antarctic Research, May 1978, 167p., Draft.
- 33-937  
Meetings, Glaciology, Research projects, Antarctica. This collection contains information on the meeting itself (lists of delegates, agenda, etc.) and 34 documents relating to the work of the committee and its working groups. Reports of all the working groups, financial statements, recommendations from the 14th meeting, reports of specialists' meetings, and reports from other groups, such as WMO, to SCAR are included.
- 33-938  
Eighteenth Soviet Antarctic Expedition. Winter research 1972-1974. (Vosemnadtsataia sovsetskaiia antarkticheskaia ekspeditsiia. Zimovochnye issledovaniia 1972-1974 gg.), Sovetskaiia antarkticheskaia ekspeditsiia, Sovetskaiia antarkticheskaia ekspeditsiia. Trudy, 1978, Vol.67, p.7-34, In Russian.
- 33-938  
Research projects, Antarctica. This overall description of the winter portion of the 18th SAE is divided into three sections. The first, general questions of expedition activity, deals with logistics and international contacts. The second, concerning engineering and construction work, covers problems of power supply, surface transport, radio communication, air operations and construction and repair activities. The third summarizes organization and methods of research in atmospheric studies, geophysical and medical research, as well as the exchange programs with the United States.
- 33-939  
Dynamics of the Balleny ice ridge. (Dinamika l'dov Ballenskogo ledovogo massiva), Eskin, L.I., Sovetskaiia antarkticheskaia ekspeditsiia. Trudy, 1978, Vol.67, p.35-40, In Russian. 5 refs.
- 33-940  
Pressure ridges, Sea ice distribution, Ice conditions, Antarctica—Balleny Islands. Features of sea ice drift resulting from constant currents and wind are determined using ice observations from ships, satellite information, and data from ships icebound in the Somov Sea. The stability of the western boundary of the ridge and the wide fluctuations in the location of ice edges on the north and east sides are discussed. In addition to the previously known cyclonic circulation of ice in the northeast part of the ridge, there was also noted an anticyclonic circulation in the southeast, which is bounded by the Ninnis Glacier on the west.
- 33-940  
Ice conditions in the Leningradskaya Station area. (Ledovye uslovia v raione stantsii Leningradskoi), Eskin, L.I., Sovetskaiia antarkticheskaia ekspeditsiia. Trudy, 1978, Vol.67, p.41-49, In Russian.
- 33-941  
Sea ice distribution, Ice breakup, Pack ice, Icebergs, Antarctica—Leningradskaya Station. A description of ice conditions around Leningradskaya in 1973 using coastal observations of the pack (ice thickness, snow density and depth) is given. Pack here may not break up for several years running, partly because of large numbers of locally formed grounded icebergs. A year-round polynya lies beyond the pack to the north and northeast of the station.
- 33-941  
Snow accumulation around Molodezhnaya Station. (Snegonakoplenie v raione stantsii Molodezhnoi), Sen'ko, P.K., Sovetskaiia antarkticheskaia ekspeditsiia. Trudy, 1978, Vol.67, p.55-57, In Russian.
- 33-942  
Snowfall, Snow cover distribution, Antarctica—Molodezhnaya Station. Snow accumulation observations were carried out along three profiles (azimuth around 140 deg) on the continental ice 8-12 km from Molodezhnaya from May 1973 until Feb. 1974. Snow depth increase occurred primarily in June and July. In November, December and January there was a decrease. Snow depth reached 50 cm in low areas of the southeastern portion of the profiles.
- 33-942  
Results of seismic observations of dynamic glacier processes at Mirny. (Nekotorye rezul'taty seismicheskikh nabludenii za lednikovymi dinamicheskimi protsessami v Mirnom), Sytinskii, A.D., et al., Sovetskaiia antarkticheskaia ekspeditsiia. Trudy, 1978, Vol.67, p.93-96, In Russian. 4 refs.
- 33-943  
Shel'piakov, B.A., Oborina, S.F.
- 33-943  
Snowquakes, Glacier ice, Icequakes, Seismology, Seasonal variations, Antarctica—Mirny Station. During the 18th SAE several hydrometeorological conditions were analyzed to determine their effect on snowquakes recorded at the seismic station at Mirny. Such quakes occur because of dynamic glacier processes. At Mirny, as opposed to Novolazarevskaya, seismic glacier activity is related to season. This relation is caused by hydrometeorological conditions, to some extent by the presence of fresh water near the ice barrier, wind and sea swell. There is no indication that local wind speed affects glacier dynamics.

33-943

Great Lakes water temperatures, 1966-1975. Grumblett, J.L., *U.S. National Oceanic and Atmospheric Administration. Technical memorandum*, Aug. 1976, ERL GLERL-11-1, 127p., PB-275 468. Full data microfiche edition available as PB-275 469. Lake water, Water temperature, Ice formation, Ice breakup, Measuring instruments.

33-944

Geomorphic role of stone movement through snow creep, Mount Twynam, Snowy Mountains, Australia. Jennings, J.N., *Geografiska annaler. Series A Physical geography*, 1978, 60(12), p.1-8, 12 refs. Snow creep, Rocks, Periglacial processes.

33-945

Hydrologic significance of nivation features in permafrost areas. Ballantyne, C.K., *Geografiska annaler. Series A Physical geography*, 1978, 60(1-2), p.51-54, 11 refs. Permafrost hydrology, Runoff, Nivation, Active layer.

33-946

Preliminary design of an experimental containerized freeze desalination unit. Fraser, J., et al., *U.S. Naval Construction Battalion Center, Port Hueneme, Calif. Contractor report*, Dec. 1977, CR 78.005, 76p. Thompson, S. Desalting, Equipment, Artificial freezing, Cost analysis.

A preliminary design of a 20,000 gpd containerized indirect contact freeze desalinator was completed. The system consists of a freezer with a defrosting cycle; wash column; indirect contact melter; and pumps, compressors, heat exchangers and controls necessary to make a complete system. At a nominal design point of 3.5% feed and at 70F, power consumption is estimated to be 77 kWh/kgal. The construction cost of a prototype unit is estimated to be \$280,000. The system is designed to operate on virtually any type of feed water. Projected performance data is given for the system operating with feed salinities from 0.5% to 3% and feed temperatures from 40F to 100F. In addition to a system with a defrosted freezer, studies were conducted of a scraped tube freezer, which indicated that both the capital and operating cost of that type of freezer would be much more expensive.

33-947

LANDSAT survey of near-shore ice conditions along the Arctic coast of Alaska. LANDSAT follow-on investigation number 21300. Stringer, W.J., et al., *U.S. National Aeronautics and Space Administration. Contractor report*, May 31, 1978, NASA-CR-157148, 212p. E78-10136. Barrett, S.A. Sea ice distribution, Ice conditions, Remote sensing, Mapping, Spaceborne photography.

33-948

Tagging of Arctic icebergs. Robe, R.Q., et al., *U.S. Coast Guard Research and Development Center. Report*, Jan. 1978, CGR&DC 1/78, 12p., ADA-054 965, 9 refs. Ellis, T.S. Icebergs, Tracking (position).

33-949

Friction of rubber on ice. Southern, E., et al., *Nature physical science*, June 26, 1972, 237(78), p.142-144, 11 refs. Walker, R.W. Rubber ice friction, Coefficients.

33-950

Reducing permafrost thaw around Arctic wellbores. Goodman, M.A., *World oil*, Apr. 1978, 186(5), p.71-76, 17 refs. Boreholes, Permafrost preservation, Wells, Thermal factors, Permafrost thermal properties, Drilling fluids.

33-951

Effect of melting on heat transfer to submerged bodies. Epstein, M., *Letters in heat and mass transfer*, Mar./Apr. 1975, 2(2), p.97-103, 9 refs. Theories, Melting, Heat transfer.

33-952

Effects of deicing salts on plant biota and soil—experimental phase. Hanes, R.E., et al., *National Cooperative Highway Research Program. Report*, 1976, No.170, 88p., 49 refs. Snow removal, Salting, Damage, Plant ecology, Soil pollution.

33-953

De-icing equipment for trawlers. Sea harvest and ocean science, Dec./Jan. 1969/1970, p.23-25. Ship icing, Ice removal equipment, Deicing.

33-954

Ice excavation machine. Vaudrey, K.D., *U.S. Naval Construction Battalion Center, Port Hueneme, Calif. Civil Engineering Laboratory. Technical report*, Feb. 1977, CEL-TR-851, 28p. ADA-037 951. Excavating equipment, Ice, Trenching, Cold weather operation, Cold weather construction, Anchors, Ice removal equipment, Snow trenches.

A 30-hp ladder-type ice trencher was selected and procured for its low ground pressure and versatility. The chain was outfitted with specifically designed conical ice teeth, and a rotating ice chipper drum was designed and fabricated for the backhoe arm. Both modifications, along with an off-the-shelf hydraulic impactor attachment, were evaluated during a field test program after undergoing shakedown performance tests in the laboratory. A similar, but larger machine with identical teeth, procured under a separate task, was observed during an extended antarctic ice-trenching operation. The CEL-designed conical teeth made both ice excavation machines very efficient trenchers, cutting over 3,000 lineal feet (900 m) of ice with an average specific energy of only 220 in.-lb/in.<sup>3</sup> (1,500 KPA). Both backhoe attachments were effective for special applications, such as ice hummock removal and deadman anchor emplacement. (Auth.)

33-955

Economic evaluation of ice and frost on bridge decks. Blackburn, R.R., et al., *National Cooperative Highway Research Program. Report*, May 1978, No.182, 83p. PB-282 288. Glennon, J.C., Glantz, W.D. Bridges, Ice control, Accidents, Countermeasures, Cost analysis.

33-956

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33-957

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33-961

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33-962

Accuracy of Canadian snow gage measurements. Goodison, B.E., *Journal of applied meteorology*, Oct. 1978, 17(10), p.1542-1548, 17 refs. Snow gages, Snowfall, Measuring instruments.

33-963

Catalog of glaciers in the USSR; Central Asia; Syrdar'ia River; Basins of the left tributaries of the Syrdar'ia downstream from the Aksu River estuary. (Katalog lednikov SSSR; Sredniaia Azia; Syrdar'ia; Basseiny levyykh pritokov r. Syrdar'i ot ust'ia r. Aksu i nizhe), Petrov, N.V., et al., *Resursy poverkhnostnykh vod SSSR: Katalog lednikov SSSR (Surface water resources: catalog of glaciers in the USSR)* Vol.14, Issue 1, Part 10, Leningrad, Gidrometeoizdat, 1974, 88p., In Russian with English table of contents enclosed. Shchetinnikov, A.S. DLC GB2507.R43 Surveys, Glaciers, Glacier oscillation, Glacial hydrology, Mountain glaciers, Maps, USSR—Syr Dar'ya River.

33-964

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33-966

Sewage and water lines in buildings. Water supply. Sewage. Outside systems and structures. Hot water supply. (Vnutrennii vodoprovod i kanalizatsiia zdani. Vodosnabzhenie. Naruzhnye seti i sooruzheniia. Goriachee vodosnabzhenie). Russia. Gosudarstvennyi komitet po delam stroitel'stva, Stroitel'nye normy i pravila. Chast' 2. Normy proektirovaniia, Gl.30, 31, 32, 34, Moscow, Stroizdat, 1978, 309p., SNiP II-30-76, II-31-74, II-32-74, II-34-76, In Russian with English table of contents enclosed. Buildings, Water supply, Sewage, Water pipelines, Water treatment, Water intakes, Water pollution, Sewage treatment, Permafrost beneath structures.

33-967

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33-969

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33-970

Climatic characteristics of Altai Mountains. (Osnovnye cherty klimata gornogo Altaia). Krivososov, B.M., Gliatsiologiya Altaia (Glaciology of Altai), No.10, Tomsk, Universitet 1976, p.44-67, In Russian. 11 refs. Climatology, Alpine soils, Alpine vegetation, Landscape types, Landscape development, Snow cover distribution, Nivation, USSR—Altai Mountains.

- 33-971**  
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Climatology, Mountain glaciers, Snow cover distribution, Glacier ablation, Alimentation, Glacial hydrology, USSR—Altai Mountains.
- 33-972**  
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Mountain glaciers, Glacier ablation, Glacial hydrology, Glacial deposits, Moraines, Floods.
- 33-973**  
Age of the end moraines in the Chagan-Uzun River valley. (Altay Mountains). (O vozraste konechnoy moreny v doline r. Chagan-Uzun (gornyy Altai)). Svitoch, A.A., et al. *Gliatsiologiya Altaia* (Glaciology of Altai), No.10, Tomsk, Universitet 1976, p.102-103, In Russian. 5 refs.  
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Mountain glaciers, Glacial deposits, Moraines, Age determination.
- 33-974**  
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- 33-975**  
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Major, R.A., Thomas, H.L., Naegle, J.N.  
Ships, Icebreakers, Ice friction, Coatings, Bubbling, Models.
- 33-976**  
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Acharya, H.K.  
Ice sheets, Seismic prospecting, Antarctica—Marie Byrd Land.  
The purpose of this study was to investigate some of the effects of anisotropy and inhomogeneity on the propagation seismic waves by theoretical analysis and comparison with seismograms from the antarctic ice sheet. Four specific topics are considered: (1) reflection coefficients at an isotropic-anisotropic boundary, (2) surface wave propagation in the presence of a strong velocity gradient, (3) conversion between body wave types upon total internal reflection, that is at the turning point of a refracted arrival, and (4) the continuous bodily conversion of P waves into shear waves in the course of propagation through a strong velocity gradient.
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Snow cover distribution, Mapping, Solar radiation, Wind factors, Terrain analysis.
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- 33-979**  
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- 33-983**  
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Pavements, Winter maintenance, Bituminous concretes, Freeze thaw cycles.
- 33-984**  
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Sea ice, Drift, Radar echoes, Computer applications.
- 33-985**  
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Military operation, Cold weather operation, Logistics.  
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- 33-991**  
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- 33-994**  
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Ice shelves, Drilling, Drills.  
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- 33-996**  
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- 33-1001**  
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- 33-1002**  
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- 33-1006**  
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- 33-1007**  
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An initial development study was completed for a versatile platform construction system to be used by the Marine Corps in any type of marginal terrain that might be encountered: marshes, drifting sand, frozen soil, etc. These platforms would be used as foundations for artillery emplacements, helicopter or VTOL pads, and various shelters. For construction at remote sites, all components of the system must be lightweight, easily handled by two men, and capable of rapid assembly without bolts or special tools. A system composed of sealed box beams covered by the interconnecting decking panels was selected for
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33-1077

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Snowfall, Snow physics, Visibility, Measurement, Aircraft icing, Light scattering.

33-1078

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Gayet, J.F., et al., *North Atlantic Treaty Organization. Advisory Group for Research and Development. AGARD conference proceedings*, Aug. 1978, No.236, Propulsion and Energetics Panel's 51st (A) Specialists' Meeting, London, 3-4 April 1978. Proceedings, p.2/1-2/12, 13 refs.  
Soulage, R.G.  
Aircraft icing, Clouds (meteorology), Cloud physics, Low temperature tests.

33-1079

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Vath, K.A., *North Atlantic Treaty Organization. Advisory Group for Research and Development. AGARD conference proceedings*, Aug. 1978, No.236, Propulsion and Energetics Panel's 51st (A) Specialists' Meeting, London, 3-4 April 1978. Proceedings, p.3/1-3/22, 13 refs.  
Aircraft icing, Ice formation, Meteorology, Clouds (meteorology).

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Aircraft icing, Low temperature tests, Test equipment, Wind tunnels, Cloud chambers, Cold chambers.

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Icing, Test equipment, Cloud chambers, Wind tunnels, Cold chambers.

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Aircraft icing, Cold chambers, Test equipment, Wind tunnels, Cloud chambers.

33-1083

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Cold weather tests, Low temperature tests, Cloud physics, Test equipment, Mathematical models.

33-1084

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Stallabrass, J.R.  
Ice detection, Aircraft icing, Ice formation.

33-1085

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Aircraft icing, Cloud physics.

33-1086

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Ice accretion, Icing, Experimental data.

33-1087

Icing tests on turbojet and turbofan engines using the NGTE engine test facility.  
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Prince, A.G.  
Ice accretion, Aircraft icing, Ice formation, Test equipment.

33-1088

Tests under snow and icing conditions with the BO 105 engine installation.  
Bender, D., *North Atlantic Treaty Organization. Advisory Group for Research and Development. AGARD conference proceedings*, Aug. 1978, No.236, Propulsion and Energetics Panel's 51st (A) Specialists' Meeting, London, 3-4 April 1978. Proceedings, p.12/1-12/12, 6 refs.  
Aircraft icing, Snowfall.

33-1089

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Grabe, W., et al., *North Atlantic Treaty Organization. Advisory Group for Research and Development. AGARD conference proceedings*, Aug. 1978, No.236, Propulsion and Energetics Panel's 51st (A) Specialists' Meeting, London, 3-4 April 1978. Proceedings, p.13/1-13/20, 4 refs.  
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Aircraft icing, Ice formation.

33-1090

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Tedstone, D., *North Atlantic Treaty Organization. Advisory Group for Aerospace Research and Development. AGARD advisory report*, Aug. 1978, No.124, 4p.  
Research projects, Meetings, Aircraft icing.

33-1091

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Glacial geology, Glacial till, Rocks, Ice creep, Glacier flow, Ice pressure.

33-1092

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Joffe, S.M., *Merentutkimuslaitos. Julkaisut*, 1978, No.243, p.3-62, 75 refs.  
Wind factors, Meteorological data, Boundary value problems, Sea ice, Surface roughness, Ice cover thickness, Ice air interface.

33-1093

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Elmroth, A., *Stockholm. Statens institut för byggnadsforskning. Document*, 1978, D10, 33p., 3 refs.  
Thermal insulation, Buildings, Construction, Design, Ventilation, Building codes.

33-1094

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Carlsson, B., et al., *Stockholm. Statens institut för byggnadsforskning. Document*, 1978, D12, 125p., 42 refs. passim.  
Stymne, H., Wettermark, G.  
Heat sources, Solar radiation, Heat transfer, Storage, Hydrates, Buildings, Heating.

33-1095

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Occhietti, S., *Revue de géographie de Montréal*, 1973, 27(4), p.365-380, In French with English summary, 78 refs.  
Glacier ice, Ice structure, Glacier movement, Glacial deposits, Glacier surveys, Tectonics, Glacial features.

33-1096

Juxtaposing arctic and subarctic island floras. (K voprosu o sopolastvenii flory ostrovov Arktiki i Subantarktik).  
Kats, N.I.A., *Moskovskoe obshchestvo ispytatelei prirody. Bulletin. Otdel biologicheskii*, May-June 1977, 81(3), p.74-81, In Russian with English summary, 20 refs.  
Arctic vegetation, Plant ecology.

Coefficients of specific community of flowering plants are given for a number of arctic and subarctic islands considered in pairs in different combinations. The coefficients of community were found to be higher the nearer to one another the islands of a given pair are. Generally they are higher in the Arctic than in the Subarctic where the islands are farther from one another and from the continents. A comparison of the number of moss and flowering plant species showed that both in the Arctic and in the Antarctic mosses are more numerous than flowering plants. (Auth.)

33-1097

Development of disturbances on mountain slope and glacier surfaces. (O razvitií vozmushchenii na poverkhnosti sklonov i lednikov).  
Bozhinskii, A.N., et al., *Moscow. Universitet. Vestnik. Seriya 5 Geografiya*, July-Aug. 1978, No.4, p.106-109, In Russian with English summary, 6 refs.  
Zeldis, I.M.  
Slope processes, Cryogenic slope processes, Slope stability, Glacier surfaces, Mathematical models.

33-1098

4-by-4 cargo/passenger van with high flotation tires.  
U.S. Naval Construction Battalion Center, Port Huemene, Calif. Civil Engineering Laboratory, *CEL techdata sheet*, Mar. 1973, 73-5, 2p., 1 ref.  
Vehicles.  
Gives basic data on a van type vehicle capable of carrying twenty passengers or 2.5 tons of cargo over improved roads of snow, ice, or frozen ground. A procurement source and a CEL contact are provided.

33-1099

4-by-4 station wagon/light cargo vehicle with high flotation tires.  
U.S. Naval Construction Battalion Center, Port Huemene, Calif. Civil Engineering Laboratory, *CEL techdata sheet*, Mar. 1973, 73-6, 2p., 1 ref.  
Vehicles.

Describes a vehicle equipped with either a station wagon or panel-delivery body for passenger or light cargo carrying in polar regions. The wagon option gives six-passenger capacity while the panel gives three passengers and an 800-pound capacity. A procurement source and a CEL contact are provided.

33-1100

Road transitions between land, snow and ice.  
U.S. Naval Construction Battalion Center, Port Huemene, Calif. Civil Engineering Laboratory, *CEL techdata sheet*, Aug. 1975, 75-21, 2p., 1 ref.  
Snow roads, Ice roads, Construction.  
Describes CEL developed procedures for coping with problems of road transition from sea ice to shelf ice, snow to land, and sea ice to land. These include constructing a timber ramp as a transition road between these various surfaces.

33-1101

Caulking compounds for application at low temperatures.  
U.S. Naval Construction Battalion Center, Port Huemene, Calif. Civil Engineering Laboratory, *CEL techdata sheet*, Mar. 1975, 75-3, 2p., 1 ref.  
Sealing, Low temperature tests, Adhesive strength.

- Reports on the extrudability of a variety of caulking materials at temperatures between 75F and -45F. Test criteria, materials tested, and test results are given and CEL contacts are identified.
- 33-1102**  
**Snow transport equipment model 1000 towed snowplow carrier.**  
U.S. Naval Construction Vitation Center, Port Hueneme, Calif. Civil Engineering Laboratory, *CEL techdata sheet*, Nov. 1974, 74-10, 1p.  
**Snow roads, Construction equipment, Skis.**  
A towed snowplow carrier for use in construction of elevated snow roads is briefly described. The advantages of this ski-mounted equipment are listed and a CEL contact is shown.
- 33-1103**  
**Electromagnetic methods for mapping shallow permafrost.**  
Hockstar, P., *Geophysics*, June 1978, 43(4), p.782-787, 11 refs.  
**Electromagnetic prospecting, Permafrost thickness, Mapping, Models.**
- 33-1104**  
**Gravity surveys in glacier-covered regions.**  
Watts, R.D., et al, *Geophysics*, June 1978, 43(4), p.819-822, 8 refs.  
Isherwood, W.  
**Gravimetric prospecting, Glaciers, Electronic equipment.**
- 33-1105**  
**Snowmelt: a two-dimensional turbulent diffusion model.**  
Weisman, R.N., *Water resources research*, Apr. 1977, 13(2), p.337-342, 18 refs.  
**Snowmelt, Turbulent diffusion, Latent heat, Heat flux, Analysis (mathematics), Models, Thermal factors.**
- 33-1106**  
**Water and ice potentials in frozen soils.**  
Groenevelt, P.H., et al, *Water resources research*, Apr. 1977, 13(2), p.445-449, 19 refs.  
Kay, B.D.  
**Frozen ground physics, Ice pressure, Water pressure, Soil moisture, Analysis (mathematics), Frozen ground thermodynamics.**
- 33-1107**  
**Polar Sub-programme.**  
World Meteorological Organization, *Global Atmospheric Research Program. GARP publications series*, 1978, No.19, 47p., Refs. passim.  
**Sea ice, Ice sheets, Climate, Snow, Weather forecasting, Research projects, Weather observations, Models.**  
This report is intended to define a polar sub-program within the objectives and planning framework of the Global Atmospheric Research Program (GARP). The objectives of the program are to identify and study polar processes relating to the improvement of weather prediction from general circulation models, and to develop a basis for understanding the role of arctic and antarctic ice in climate dynamics. The report provides an overview of the GARP polar sub-program and its scientific background, reviews the Polar Experiment (POLEX) to be carried out simultaneously with the First GARP Global Experiment (FGGE), discusses polar processes in climate modeling, and describes climate-related experiments and monitoring for the program.
- 33-1108**  
**Flow-visualization by means of soap bubbles on snowdrift around the huts at Syowa Station.**  
Sato, T., et al, *Antarctic record*, Sep. 1978, No.62, p.1-22, In Japanese with English summary. 17 refs.  
Hannuki, T.  
**Snowdrifts, Wind tunnels, Wind (meteorology), Antarctica—Showa Station.**  
Wind tunnel tests were conducted in order to predict profiles of snowdrift around buildings at Showa Station. Assuming that snowflakes in wind velocity fields exceeding the mean wind velocity flow along with the wind, and snowflakes in those fields not exceeding it tend to accumulate on the ground surface, the profiles of the snowdrift around the buildings can be predicted. The results of wind tunnel tests are as follows. (1) The profile of the snowdrift changes according to the surface friction velocity of the surface boundary layer and the altitude of the plume. (2) The profile of the snowdrift can be predicted in the division of the wind velocity field at the altitude Z. (3) The variation of the snowdrift profile can also be expressed by the index K of the fluid energy of the mean wind. (Auth. mod.)
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**Meetings, Remote sensing, Ice, Snow cover distribution, Forests.**
- 33-1110**  
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Gedney, R.T., et al, Canadian Symposium on Remote Sensing, 3rd, Edmonton, Alta., 1975. Proceedings, edited by G.E. Thompson, Ottawa, Canadian Aeronautics and Space Institute, 1976, p.73-82, 6 refs.  
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- 33-1111**  
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**Sea ice, Spaceborne photography, Data transmission.**
- 33-1112**  
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- 33-1113**  
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DLC G70.4.C26 1975  
**Snow cover distribution, Mapping, Flood forecasting, Canada—New Brunswick—Saint John River.**
- 33-1114**  
**Proceedings.**  
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**Meetings, Remote sensing, Ice, Snow cover.**
- 33-1115**  
**Satellite imagery analysis of snow cover in the Saint John and Souris River basins.**  
Ferguson, H.L., et al, Canadian Symposium on Remote Sensing, 4th, Quebec, 1977. Proceedings, Ottawa, Canada Aeronautics and Space Institute, 1977, p.126-142, In English with French summary. 7 refs.  
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- 33-1116**  
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- 33-1117**  
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- 33-1118**  
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- 33-1119**  
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- 33-1124**  
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- 33-1125**  
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- 33-1126**  
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- 33-1132**  
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- 33-1136**  
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Petroleum industry, Swamps, Peat, Drainage, Pipelines, Buildings, Engineering geology, USSR—Tomsk.
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Computer simulation of bubbler-induced melting of ice covers using experimental heat transfer results. (Imitatsionnoe modelirovanie taniia pokrytiya leda s ispol'zovaniem rezul'tatov eksperimental'nykh issledovanij peredachi tepla), Keribar, R., et al, Canadian journal of civil engineering, Sep. 1978, 5(3), p.362-366, In English with French summary. 9 refs.  
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Ice melting, Artificial melting, Bubbling, Computerized simulation.  
Results of laboratory experiments conducted to determine bubbler-induced heat transfer coefficients are reported. Implications and validity of results are discussed. As a second step, a procedure for computer-simulating the behavior of an ice sheet whose thickness is controlled by a bubbler system operating intermittently over a long period of time is developed. The simulation uses experimentally determined bubbler heat transfer coefficients, weather data, site characteristics, and desired performance at input data, and a finite difference method to solve the equations governing the ice thickness and temperature profile. Through an example simulation, the usefulness of the procedure in predicting ice thickness and temperature profile histories, and the effectiveness or suitability of a given bubbler system are demonstrated.
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Lake ice, Ice jams, Flooding, Ice control, Ice navigation.

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Upper limit of patterned ground. (Obergrenze von Frostbodenerscheinungen).  
Kuhle, M., *Zeitschrift für Geomorphologie*, Sep. 1978, 22(3), p.350-356, In German with English summary. 1 ref.  
Patterned ground, Polygonal topography, Frost penetration, Frozen ground thermodynamics, Solifluction.
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Polar Star—Sitreps one.  
Venzke, N.C., *U.S. Naval Institute. Proceedings*, Oct. 1978, 104(10), p.103-106.  
Ships, Icebreakers, Engines, Propellers.
- 33-1248  
Polar Star—the second time around.  
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Sea ice, Icebreakers, Engines, Propellers, Ice breaking.  
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Polar Sea's story.  
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Economic development, Urban planning, Oil recovery, Offshore drilling, Transportation, Water supply, United States—Alaska—Kenai Peninsula.
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Application of air cushion configurations to icebreaking.  
Decker, J.L., *U.S. Maritime Administration. Report*, July 1978, MA-RD-940-78058, 187p. + append., 37 refs.  
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- 33-1252  
Strait of Magellan crossing completed in austral summer.  
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Pipe laying, Gas pipelines, Hydraulic structures, Logistics.
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Salt lakes, Limnology, Hydrography, Ecology, Agriculture, Water temperature, Heat balance, Solar radiation, Optical properties, Canada—Saskatchewan.
- 33-1254  
Methodology and accuracy of snowmelt computation. (Zur Methodik und Genauigkeit der Schneeschmelzberechnung).  
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Snowmelt, Snow cover distribution, Snow water equivalent, Heat transfer, Vegetation factors, Forest land, Degree days, Accuracy.
- 33-1255  
Salt resistance of a cement stabilizer. (Die Tausalzbeständigkeit einer Zementstabilisierung).  
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Anticaking additives, Cements, Pavements, Frost action, Freeze thaw tests.
- 33-1256  
Landsat image: Disko Sound, Western Greenland. Polar sea and arctic landscape between Disko Island and the ice sheet. (Satellitenbild: Diskobugt/Westgrönland. Polares Meer und arktische Landschaft zwischen Diskoinsel und Inlandeis).  
List, F.K., et al, *Erde*, 1978, 109(2), p.122-135, In German with English summary. 30 refs.  
Stablein, G.  
Sea ice distribution, Ice conditions, Landscape types, LANDSAT, Remote sensing, Polar regions, Meteorological factors, Spacecraft, Greenland.
- 33-1257  
Cartographic representation of the polar regions up to and including the 19th century. (Die kartographische Darstellung der Polargebiete bis in das 19. Jahrhundert).  
Zögner, L., *Erde*, 1978, 109(2), p.136-152, In German with English summary. 38 refs.  
Maps, Polar regions, History.  
Important periods in the progress of polar research and the development of geographical knowledge of the polar regions are illustrated by characteristic maps. Legends such as a terra australis and an Arctic Ocean open on all sides affected polar cartography for a long time. The geographical theories of Delisle/Buache in the 18th and A. Petermann in the 19th centuries influenced cartographic representation. In the 19th century successful research in polar regions and the use of modern scientific methods were matched by a rapid increase in knowledge and constant improvement of map faces. (Auth.)
- 33-1258  
Earth science investigations on the sixth continent. (Über die geowissenschaftlichen Forschungen auf dem sechsten Kontinent).  
Kohnen, H., *Erde*, 1978, 109(2), p.153-187, In German with English summary. Refs. p.184-187.  
Glacier mass balance, Ice sheets, Ice conditions, Mapping, Tectonics, Earth crust.  
The present article reviews characteristic features of the physical nature of Antarctica and outlines relevant scientific results. The discussion is, however, confined to geosciences. The progress of mapping is discussed and the essential results of tectonic and geological research, as well as investigations of the earth's crust, are reported. Much effort is devoted to the ice, which is the most widespread mineral in Antarctica, covering 98% of the continental area. Emphasis is placed on the distribution, the mass balance, the motion of the ice and the stability conditions of the sheet. Finally, a brief review of the antarctic climate is given, summarizing the most typical and harsh features. A general view of the history of exploration and of the political and economic potential of Antarctica is given. (Auth.)
- 33-1259  
Exploration and exploitation of mineral resources in the Arctic. (Erschließung und Gewinnung mineralischer Rohstoffe in der Arktis).  
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Pluhar, E.  
Economic development, Minerals, Oil recovery, Arctic regions, Ecology, Meteorological factors, Permafrost preservation.
- 33-1260  
Baykal-Amur mainline (BAM). Route and economic development along a Soviet railway line. (Die Baikäl-Amur-Eisenbahnmagistrale (BAM). Trassenverlauf und wirtschaftliche Erschließung entlang einer sowjetischen Bahnlinie).  
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Railroads, Transportation, Minerals, Baykal Amur railroad.
- 33-1261  
Traditions and current tasks of polar research. (Traditionen und aktuelle Aufgaben der Polarforschung).  
Stablein, G., *Erde*, 1978, 109(2), p.229-267, In German with English summary. Refs. p.263-276.  
Research projects, History, Expeditions, Polar regions.  
Today arctic and antarctic research is less popular than at the time of the last voyages of discovery. The history of German polar research and the support given to it by the Berlin Geographical Society are described. The attempt is made to order the phases of development of polar research according to its changed aims and methods. An indication of current polar research activities is given by means of a selection of descriptions by various polar research institutions of themselves and their programs. (Auth. mod.)
- 33-1262  
New findings on the composition and structure of the northern ice sheet. (Neue Ergebnisse zum Aufbau und zur Struktur des Nordischen Inlandeises).  
Liedtke, H., *Zeitschrift für Geomorphologie*, June 1978, 22(2), p.230-235, In German.  
Ice structure, Ice composition, Ice sheets, Ice mechanics.
- 33-1263  
Generations of rock glaciers and ice-cored moraines on Nevado de Toluca Volcano, Mexico. (Blockgletscher- und Blockzungen-Generationen am Nevado de Toluca, Mexiko).  
Heine, K., *Erde*, 1976, 107(4), p.330-352, In German with English summary. 23 refs.  
Rock glaciers, Glacial deposits, Moraines, Paleoclimatology, Alpine glaciation, Mexico—Nevado de Toluca.
- 33-1264  
Model for Holocene retreat of the West Antarctic Ice Sheet.  
Thomas, R.H., et al, *Quaternary research*, 1978, 10(2), p.150-170, 36 refs.  
Bentley, C.R.  
Ice sheets, Ice shelves, Ice models.  
Equations are derived that can be used to make a quantitative estimate of the maximum size of a marine ice sheet and of when and how rapidly retreat would take place under prescribed conditions. Ice sheet growth is favored by falling sea level and uplift of the seabed. In most cases the buttressing effect of a partially grounded ice shelf is a prerequisite for maximum growth out to the edge of the continental shelf. Collapse is triggered most easily by eustatic rise in sea level, but it is possible that the ice sheet may self-destruct by depressing the edge of the continental shelf so that sea depth is increased at the equilibrium grounding line. Application of the equations to a hypothetical "Ross Ice Sheet" that 18,000 yr ago may have covered the present-day Ross Ice Shelf indicates that, if the ice sheet existed, it probably extended to a line of sills parallel to the edge of the Ross Sea continental shelf. By allowing world sea level to rise from its late-Wisconsinan minimum it was possible to calculate retreat rates for individual ice streams that drained the "Ross Ice Sheet". If ice shelves did not form during retreat then the analysis indicates that most of the West Antarctic Ice Sheet would have collapsed by 9000 yr B.P. Thus, the present-day Ross Ice Shelf (and probably the Ronne Ice Shelf) serves to stabilize the West Antarctic Ice Sheet which would collapse very rapidly if the ice shelves were removed. Rebound of the seabed after the ice sheet had retreated to an equilibrium position would allow the ice sheet to advance once more. (Auth. mod.)
- 33-1265  
Implications of outer space technology on development in meteorology and meteorological services.  
Johnson, A.W., *World Meteorological Organization. WMO bulletin*, July 1975, 24(3), p.162-170.  
Spaceborne photography, Weather observations, Ice conditions, Icebergs, Sea ice, Weather forecasting.  
Developments in the meteorological satellite program since the first TIROS satellite was launched in Apr. 1960, and the inception of geostationary satellites are summarized. Among the applications of weather satellite imagery discussed and illustrated are the following: the characteristics of the Gulf Stream; analysis of the daily ice field in the Arctic and Antarctic; iceberg formation and drift in the Antarctic; tornado and severe storm warning; vertical temperature profiles and moisture soundings; the distribution of snow; measurements of wind from cloud movements; and hurricane formation over tropical areas. The availability of the data and international cooperation in future satellite programs are discussed.
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Damage and recovery of tundra vegetation.  
Webber, P.J., et al, *Environmental conservation*, Autumn 1978, 5(3), p.171-182, Refs. p.180-182.  
Ives, J.D.  
Tundra vegetation, Damage, Revegetation, Arctic vegetation, Ecosystems, Human factors.
- 33-1267  
Investigation of the solubility and diffusion of hydrochloric acid in ice.  
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Glacier ablation, Air temperature, Glacier mass balance, Models.

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- 33-1270**  
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Study of ice growth in slightly undercooled water. Fujioka, T., Pittsburgh, Pa., Carnegie-Mellon University, 1978, 306p., University Microfilms order No.7815199, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, Sep. 1978, p.1438-1439. Ice crystal growth, Ice crystal structure, Thermal factors, Mathematical models, Experimentation.
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- 33-1282**  
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- 33-1286**  
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- 33-1287**  
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- 33-1289**  
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- 33-1290**  
Mechanization of mining processes at the "Severnii" quarry of the Chasov-Iarskii fire clay deposit. (Mekhanizatsiia gornykh rabot na kar'ere "Severnii" Chasov-Iarskogo mestorozhdeniia ognepurnoi gliny). Garmash, N.Z., et al., Voprosy razrabotki nerudnykh i rudnykh mestorozhdenii (Mining metallic and non-metallic ore deposits) edited by N.A. Garmash, Moscow, Nedra, 1972, p.82-89, In Russian. 1 ref. Maksimenko, A.I.A., Khar'kovskii, V.I.A. DLC TN275.1V58 Clays, Mining, Excavating equipment, Frozen ground.
- 33-1291**  
Peculiarities of cutting frozen and thawed fire clay. (Nekotorye osobennosti rezaniia taloi i merzloi ognepurnoi gliny). Moiseenko, V.G., et al., Voprosy razrabotki nerudnykh i rudnykh mestorozhdenii (Mining metallic and non-metallic ore deposits) edited by N.Z. Garmash, Moscow, Nedra, 1972, p.125-130, In Russian. 3 refs. Seroshtan, V.I. DLC TN275.A1V58 Clay soils, Frozen fines, Earthwork, Excavation.
- 33-1292**  
Results of magnetotelluric surveys in the West Siberian arctic. (O rezul'tatakh rabot metodom MTP v Zapadno-Sibirskom Zapoliar'e). Kopelev, I.U.S., Elektromagnitnoe zondirovanie i magnito-telluricheskie metody razvedki (Electromagnetic sounding and magnetotelluric surveys) edited by B.M. IAnovskii, Leningrad, Universitet, 1963, p.149-151, In Russian. DLC TN269.K63 Magnetic surveys, Geophysical surveys, Polar regions.
- 33-1293**  
Seasonal and weather-related dynamics of phytomass in subarctic tundra. (Sezonnaia i pogodovaia dinamika fitomassy v subarkticheskoi tundre). Andreev, V.N., et al., Novosibirsk, Nauka, 1978, 191p., In Russian. Refs. p.184-190. Arctic vegetation, Tundra vegetation, Biomass, Tundra soils, Plant ecology, Plant physiology, Soil chemistry, Soil formation, Research projects.
- 33-1294**  
Moraines of probable Miocene age, Dry Valleys, Antarctica. Claridge, G.G.C., et al., *New Zealand antarctic record*, 1978, (12), p.1-5, 3 refs. Campbell, I.B. Moraines, Glacial deposits, Glacial geology, Soil surveys. Recent investigations of old moraine deposits found at the mouths of all valleys between Tyrol and Nibelungen Valleys indicate a pressured ice advance westward up the Wright Valley between the time the valley was first cut during the mid-Miocene times and the Wright Upper IV episode which occurred more than 3.7 m.y.a. Features of the dry valleys displaying evidence of this very early ice advance are cited. The presence of 1300 m of ice moving in a westerly direction in the Wright

Valley implies a great depth of grounded ice in the Ross Sea associated with a low sea level during the late Miocene-early Pliocene times.

## 33-1295

**Nature of the soil of Mars: evidence from Antarctica.** Campbell, I.B., et al, *New Zealand antarctic record*, 1978, 1(2), p.6-9, 8 refs.

Claridge, G.G.C.

**Mars (planet), Soil surveys, Clay minerals, Soil moisture.**

Based on observations of the Martian surface and similarities recognized between Martian soils and the older soils of Antarctica, it is concluded that the soils on Mars have been formed through long-continued weathering of basic igneous rocks, and that they consist of a mixture of coarse and fine material to a depth of several meters, of which all except the upper meter is ice-cemented. Weathering has caused exposed surfaces of all rocks to be covered with a film of iron oxides, clay minerals and other weathering products. The clay content of the Martian surface is greater than that of even the most weathered antarctic soils.

## 33-1296

**Aluminum corrosion assessment in Antarctica.** Fahy, F.W., *New Zealand antarctic record*, 1978, 1(2), p.20-25, 5 refs.

**Aluminum, Corrosion.**

In order to develop cost-effective ways of protecting architectural aluminum against pollution-induced corrosion, racks of aluminum coupons have been mounted in sites widely varying in climate, i.e., New Guinea, Scott Base and Arrival Heights. The coupon material mounting system and anodizing process are briefly described, and weight changes of the coupons during atmospheric exposure at the various sites are illustrated.

## 33-1297

**Concreting in Antarctica.** Varcoe, G.E., *New Zealand antarctic record*, 1978, 1(2), p.26-30.

**Winter concreting, Concrete construction, Cold weather construction, Permafrost, Cold weather tests.**

Tests of trial mixes of concrete aggregate to be used in construction at Scott Base indicated that difficulty would be experienced in making a workable concrete mix with the "red" or No.1 aggregate, but that satisfactory concrete could be made with the "black" aggregate (No.2). However, both aggregates will require a high cement content. Methods are outlined for supplying cement to Scott Base, supplying and testing aggregate, supplying and heating water, heating and drying aggregate, mixing, insulating aggregate from permafrost, and keeping placed concrete from freezing.

## 33-1298

**Sea ice organisms and their importance to the antarctic ecosystem (Review).** Bradford, J.M., *New Zealand antarctic record*, 1978, 1(2), p.43-50, 29 refs.

**Cryobiology, Microbiology.**

An attempt is made to bring together existing knowledge on ice communities and show how the microscopic plant community develops in the ice, the kinds of organisms (animal and plant) which contribute to the community, and their importance to the antarctic ecosystem. Living microalgae are incorporated continuously into the underside of the annual sea ice during its progressive formation. Different species of diatoms dominate the autumn and spring communities; *Nitzschia*, *Fragilariopsis* and flagellates are found in the autumn and into winter, whereas *Peridinium* appears in Aug. and *Amphiprora*, *Stephanopyxis*, *Nitzschia* and *Navicula* begin to increase between Oct. and Nov. According to Andriashvili (1968) there is a strict ice fauna which lives at least temporarily in the ice and a sub-ice fauna whose members never enter directly into the loose ice, but are to some degree in trophic connection with the ice community. The ice fauna may consist of polychaete worms, copepods, amphipods, fingerlings of the fish *Trematomus borchgrevinkii*, ciliates, and juveniles of the foram *Globobulimina*. The sub-ice fauna consists of adult *Trematomus borchgrevinkii*, the krill *Euphausia crystallorophias*, and at some times of the year *E. superba*.

## 33-1299

**United States Arctic policy.** Smith, B.D., Oceans policy study, 1:1, Charlottesville, University of Virginia, Center for Oceans Law and Policy, Jan. 1978, 40p., Numerous refs. passim.

**Environments, Environmental impact, Arctic climate, Pollution, Crude oil, Natural gas, Minerals.**

## 33-1300

**Permanent flow of a non-linear viscous fluid (Glen's body) around a perfectly smooth sphere.** (Ecoulement permanent d'un fluide visqueux non linéaire (corps de Glen) autour d'une sphère parfaitement lisse). Liboutry, L., et al, *Annales de géophysique*, Apr.-June 1978, 34(2), p.133-146, In French with English summary. 14 refs.

**Ritz, C.**  
**Glacier flow, Viscous flow, Rheology, Stresses.**

## 33-1301

**Sliding of a glacier over a plane with scattered hemispherical obstacles.** (Glissement d'un glacier sur un plan parsemé d'obstacles hémisphériques). Liboutry, L., *Annales de géophysique*, Apr.-June 1978, 34(2), p.147-162, In French with English summary. 22 refs.

**Glacier movement, Glacier flow, Plastic flow, Sliding, Viscous flow, Geothermal thawing, Glacier friction, Seasonal variations, Rheology.**

## 33-1302

**Consolidation of thawing soils.** Nixon, J.F., Edmonton, University of Alberta, 1973, 300p., Canadian theses on microfiche, No.17639, Ph.D. thesis. Refs. p.253-256.

**Permafrost thermal properties, Ground thawing, Permafrost heat transfer, Freeze thaw cycles, Frozen ground settling, Stresses, Hot oil lines, Settlement (Structural), Soil mechanics.**

## 33-1303

**Eleven year chronicle of one of the world's most gigantic icebergs.** McClain, E.P., *Mariners weather log*, Sep. 1978, 22(5), p.328-333, 18 refs.

**Icebergs, Sea ice distribution, Ice conditions, Drift, Photointerpretation, Spacecraft.**

Data on satellite-determined positions of the Trollunga giant iceberg during 1967 through 1978 are reported. The iceberg was formed in 1967 from the Trollunga ice tongue at 69.5S and 1W, and was named after its origin. Chronology and dimensions of the gigantic iceberg are tabulated. The amount of melting, average speed of the iceberg along the ocean currents and sea water temperature are discussed in the context of utilizing icebergs as a source of fresh water.

## 33-1304

**Evaluation of levels of Pb, V, Cd, Zn and Cu in the snow of Mt. Blanc during the last 25 years.**

Briat, M., International Colloquium on Polluted Atmospheres, 13th, Paris, France, April 25-28, 1978. Proceedings. Edited by M.M. Benarie, Studies in environmental science, Vol.1, Amsterdam, The Netherlands, Elsevier Scientific Publishing Co., 1978, p.225-228, 10 refs.

**Snow composition, Chemical analysis, Pollution.**

For evaluating the influence of pollution on the atmosphere in temperate regions, samples from a snow core covering the period 1948-1974 and situated at the 4250 m level of the Mt. Blanc massif were analyzed for chemical composition. All the elements analyzed, except Cl, which is produced primarily by marine sources, are mostly of continental origin and can be explained as such. However, levels of Pb, V and Cd have increased up to a net factor of 2 since 1950, which parallels increased production of gasoline additives (Pb), increased use of heavy oils (V) and increased consumption of gasoline (Cd). Concentration of chemical elements in the snow of Mt. Blanc is compared to that of Antarctica, Greenland and Gt. Britain.

## 33-1305

**Ice loads on bridge piers.** Watts, F.J., et al, *Public roads*, Sep. 1978, 42(2), p.63-70, 11 refs. For this report in full see 33-3862.

**Podolny, W., Jr.**

**Ice loads, Ice pressure, Ice strength, River ice, Ice jams, Piers, Ice solid interface.**

## 33-1306

**Recent evolution of strong acidity of snow at Mt. Blanc.**

Delmas, R., et al, International Colloquium on Polluted Atmospheres, 13th, Paris, France, April 25-28, 1978. Proceedings. Edited by M.M. Benarie, Studies in environmental science, Vol.1, Amsterdam, The Netherlands, Elsevier Scientific Publishing Co., 1978, p.233-237, 12 refs.

**Aristarain, A.**

**Snow composition, Acidity, Pollution, Chemical reactions, Sulfur oxide.**

## 33-1307

**Potentiometric microdetermination of sulphate ions.** (Microdosage potentiométrique de l'ion sulfate). Delmas, R., *Mikrochimica acta (Wien)*, 1978, Vol.1, p.219-228, In French with German and English summaries. 13 refs.

**Snow recrystallization, Snowmelt, Chemical analysis, Ions, Microanalysis.**

## 33-1308

**Drift ice features in the Jamésie and Hudson areas, Subarctic Quebec.** (Le glacier en Jamésie et en Hudson, Québec subarctique). Dionne, J.C., *Géographie physique du Quatenaire*, 1978, 32(1), p.3-70, In French. Refs. p.29-33.

**Drift, Glacial deposits, Coastal topographic features, Sediments, Glacial erosion.**

## 33-1309

**Calculation of surface temperature and ice accretion rate in a mixed water droplet/ice crystal cloud.**

Cansdale, J.T., et al, *Gt. Britain. Royal Aircraft Establishment. Technical report*, June 1977, No.77090, 24p. + 6p. of figures, 17 refs.

**McNaughtan, I.I.**

**Ice accretion, Ice crystal adhesion, Surface temperature, Cloud droplets, Supercooled clouds, Cloud physics, Analysis (mathematics).**

## 33-1310

**Roof-snow behavior and ice-dam prevention in residential housing.**

Granke, H.L., et al, Extension bulletin, 399-1976, U.S. Dept. of Agriculture, [1976], 19p., 25 refs.

**Hendricks, L.T.**

**Roofs, Snow accumulation, Snow cover distribution, Snow melting, Meltwater, Damage, Ice dams, Countermeasures, Residential buildings.**

## 33-1311

**Annotated bibliography of recent research undertaken in the Labrador-Ungava area, near Schefferville, Quebec.**

Granberg, C., *McGill Subarctic Research Laboratory. McGill subarctic research papers*, May 1978, No.28, 63p., 45 refs.

**Active layer, Glaciology, Snow cover, Environments, Transportation, Subarctic climate, Subarctic vegetation, Bibliographies, Research projects.**

## 33-1312

**Problems in soil science and engineering geology.** (Voprosy inzhenernoi geologii i gruntovedeniia). Voronkevich, S.D., ed, Moscow, Universitet, 1978, 269p., In Russian. For selected papers see 33-1313 through 33-1326. Refs. passim.

**Engineering geology, Soil mechanics, Clay soils, Thermal stresses, Deformation, Slope processes, Slope stability, Soil stabilization, Cements.**

## 33-1313

**Nature of structural bonds in clay rocks.** (Priroda strukturnykh svyazei v glinistykh porodakh). Osipov, V.I., *Voprosy inzhenernoi geologii i gruntovedeniia* (Problems in soil science and engineering geology) edited by S.D. Voronkevich, Moscow, Universitet, 1978, p.22-36, In Russian. 32 refs.

**Clays, Clay minerals, Bearing strength, Magnetic properties, Molecular structure.**

## 33-1314

**Formation of engineering-geological properties of clays in the zone of catagenesis.** (Formirovaniye inzhenerno-geologicheskikh svoystv glinistykh porod v zone katagenez). Krivosheeva, Z.A., *Voprosy inzhenernoi geologii i gruntovedeniia* (Problems in soil science and engineering geology) edited by S.D. Voronkevich, Moscow, Universitet, 1978, p.37-44, In Russian. 13 refs.

**Clay soils, Clay minerals, Clays, Bearing strength, Porosity, Ground water, Phase transformations.**

## 33-1315

**Studying the process of clay soil settling.** (Issledovaniye protsessov usadki glinistykh gruntov). Dimitrova, R.I., *Voprosy inzhenernoi geologii i gruntovedeniia* (Problems in soil science and engineering geology) edited by S.D. Voronkevich, Moscow, Universitet, 1978, p.66-69, In Russian.

**Clay soils, Clay minerals, Soil moisture migration, Settlement (structural).**

## 33-1316

**Effect of ground water regime and earthquakes on the stability of landslide slopes in mountains.** (Vliyanie rezhima obvodneniya i zemletreseniy na ustoychivost' gornykh opolznevykh sklonov). Fedorenko, V.S., et al, *Voprosy inzhenernoi geologii i gruntovedeniia* (Problems in soil science and engineering geology) edited by S.D. Voronkevich, Moscow, Universitet, 1978, p.81-94, In Russian. 9 refs.

**Slope processes, Landslides, Slope stability, Soil moisture migration, Soil temperature, Earthquakes.**

## 33-1317

**Model studies of the state of stress and stability of landslide slopes, using elastic materials.** (Izucheniye napriazhennogo sostoyaniya na modeliakh iz uprugikh materialov dlia otsenki ustoychivosti opolznevykh sklonov). Maksimov, S.N., *Voprosy inzhenernoi geologii i gruntovedeniia* (Problems in soil science and engineering geology) edited by S.D. Voronkevich, Moscow, Universitet, 1978, p.109-115, In Russian. 6 refs.

**Slope processes, Models, Landslides, Slope stability, Clay soils, Loams.**

- 33-1318**  
Calculating stresses according to measured deformations while experimenting with equivalent materials models. (Metod rascheta velichin napriazhenii po izmerennym deformatsiyam pri eksperimentakh na modelyakh iz ekvivalentnykh materialov), Vagner, P., et al, Voprosy inzhenernoi geologii i gruntovedeniia (Problems in soil science and engineering geology) edited by S.D. Voronkevich, Moscow, Universitet, 1978, p.122-126, In Russian. 2 refs. Mamaev, I.U.A.  
Slope processes, Slope stability, Landslides, Models.
- 33-1319**  
Comparative evaluation of the complexity of engineering and geological conditions in different regions of the West Siberian platform. (Sravnitel'naya otsenka slozhnosti inzhenerno-geologicheskikh uslovii razlichnykh raionov Zapadno-Sibirskoi plity), Trofimov, V.T., Voprosy inzhenernoi geologii i gruntovedeniia (Problems in soil science and engineering geology) edited by S.D. Voronkevich, Moscow, Universitet, 1978, p.150-162, In Russian. 8 refs.  
Engineering geology, Maps, Permafrost distribution, Active layer thickness, Discontinuous permafrost, Permafrost hydrology.
- 33-1320**  
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Rocks, Crack propagation, Cements, Mortars, Hydraulic structures, Foundations.
- 33-1321**  
Sorption properties of sandstones as related to silicate solution and its role in the injection process. (Sorbtionnaya sposobnost' peschanykh porod po otnosheniiu silikatnogo rastvora i ee rol' v in'ektsionnom protsesse), Voronkevich, S.D., et al, Voprosy inzhenernoi geologii i gruntovedeniia (Problems in soil science and engineering geology) edited by S.D. Voronkevich, Moscow, Universitet, 1978, p.210-215, In Russian. 6 refs. Golodnov, V.M., Sergeev, V.I., Popova, E.B.  
Soil stabilization, Sands, Cements.
- 33-1322**  
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Soil stabilization, Cements, Soil composition, Soil chemistry, Electric power plants, Ashes.
- 33-1323**  
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Frost resistance, Soil stabilization, Clay soils, Freeze thaw cycles, Cements, Waste disposal, Ashes.
- 33-1325**  
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Clay soils, Clay minerals, Soil stabilization, Thermoelectric effects, Electric heating.
- 33-1326**  
Influence of gravity and electrical fields in electroosmotic drying and compacting of clay soils. (Ob ispol'zovanii gravitatsionnogo i elektricheskogo polei pri elektroosmoticheskom osushenii i uplotnenii glinistykh gruntov), Sokolovskii, A.T., et al, Voprosy inzhenernoi geologii i gruntovedeniia (Problems in soil science and engineering geology) edited by S.D. Voronkevich, Moscow, Universitet, 1978, p.248-251, In Russian. 1 ref. Zlochevskaia, R.I.  
Clay soils, Soil stabilization, Electroosmosis.
- 33-1327**  
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Sea ice, Ice air interface, Heat transfer, Air temperature, Ice temperature, Thermal conductivity, Solar radiation, Mathematical models, Computer applications, Arctic Ocean.
- 33-1328**  
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DLC TH443.M6  
Damage, Residential buildings, Industrial buildings, Large panel buildings, Prefabrication, Thermal stresses, Settlement (structural), Construction materials, Cold weather construction, Failure.
- 33-1329**  
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DLC TH443.M6  
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- 33-1330**  
Failure of macroporous and slag concretes under severe climatic conditions and repair techniques. (Povrezhdenie krupnoporistogo i shlakovogo betona v surovyykh klimaticheskikh usloviakh i metody ego vosstanovleniia), Shishkin, A.A., et al, Analiz prichin avari i povrezhdenii stroitel'nykh konstruktov, Vypusk 5 (Causes of damage and failure of buildings, No.5) edited by A.A. Shishkin, Moscow, Stroizdat, 1973, p.70-106, In Russian. 7 refs.  
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DLC TH443.M6  
Winter maintenance, Residential buildings, Construction materials, Frost resistance, Frost shattering, Cold weather performance, USSR—Kola Peninsula.
- 33-1331**  
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Buildings, Bricks, Mortars, Frost resistance, Cold weather construction.
- 33-1332**  
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- 33-1333**  
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DLC TH443.M6  
Residential buildings, Bricks, Mortars, Cold weather construction.
- 33-1334**  
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DLC TH443.M6  
Concrete structures, Buildings, Winter concreting, Concrete freezing, Large panel buildings, Mortars, Frost resistance.
- 33-1335**  
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Concrete structures, Walls, Winter concreting.
- 33-1336**  
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DLC TH443.M6  
Buildings, Bricks, Cold weather construction, Mortars, Antifreezes.
- 33-1337**  
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- 33-1338**  
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- 33-1341**  
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- 33-1342**  
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- 33-1343**  
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- 33-1344**  
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- 33-1349**  
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Waste disposal, Sewage disposal, Grasses, Growth, Chemical composition.  
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- 33-1363**  
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- Oceanographic surveys, Stresses, Sea water, Ice water interface, Ocean currents.
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Decay patterns of land-fast sea ice in Canada and Alaska.  
Bilello, M.A., MP 1161, Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.2, Seattle, University of Washington, 1977, p.1-10, 11 refs.
- Sea ice, Fast ice, Ice cover thickness, Ice deterioration, Meteorological factors.
- Weekly measurements of the thickness of land-fast sea ice made over a period of 10 to 15 years at a number of coastal locations in Canada and Alaska were analyzed. That portion of the data relating to maximum ice thickness and decay (i.e., the decrease in ice thickness) are presented and examined. Many meteorological and marine factors affect the decay process. This study investigates the effects of two important weather elements: air temperature and solar radiation. Complete and reliable air temperature data for each station made it possible to analyze the relationship between accumulated thawing degree-days (ATDD) and sea ice ablation. The relationship between ice decrease and daily accumulated solar radiation was investigated; the results were comparable to those derived when ATDD was used as the dependent variable. Other factors affecting ice ablation and breakup, such as snow-ice formation, snow cover depth, and wind, are also discussed in the study.
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Microwave scanning the Arctic pack ice.  
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- Pack ice, Ice conditions, Infrared radiation, Microwaves.
- 33-1394  
Nearshore ice motion near Prudhoe Bay, Alaska.  
Tucker, W.B., et al, MP 1162, Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.2, Seattle, University of Washington, 1977, p.23-31, 7 refs.
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- Sea ice, Drift, Ice temperature, Thermal expansion.
- Shorefast and nearshore pack ice motions in the vicinity of Prudhoe Bay, Alaska, have been monitored for the spring seasons (March-June) of 1976 and 1977. From the base camp on Narwhal Island, a barrier island 25 km northeast of Prudhoe Bay, a ranging laser was used to measure distances to targets located on the fast ice within a 7 km radius of the island. To assess pack ice motions, a radar transponder system with tracking stations located on Narwhal and Cross Islands was used to monitor the positions of transponders placed on the pack ice as far as 37 km northeast of the islands. These results suggest that gyre movement or slippage of the nearshore pack ice in this area apparently does not begin until early to mid-summer. The

pack ice in this area responds slowly, and only weakly to local winds. The mesoscale displacements that occurred took place only after several days of consistent offshore winds. This indicates that a significant shoreward stress originating in the more distant pack heavily influences the dynamics of this nearshore area.

33-1395

**Characterization of the surface roughness and floe geometry of the sea ice over the continental shelves of the Beaufort and Chukchi Seas.**

Weeks, W.F., et al, MP 1163, Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.2, Seattle, University of Washington, 1977, p.32-41, 9 refs.

**Tucker, W.B., Frank, M., Fungcharoen, S. Sea ice distribution, Surface roughness, Side looking radar, Pressure ridges.**

This paper reports on observations primarily made during the late winter and early spring of 1976 when the ice cover was at its maximum extent, and very few leads were observed. The primary sensors used were a laser profilometer and an X-band side-looking airborne radar (SLAR) system. The heaviest ridging was found at Barter Island and there was a general decrease in the number of ridges as one moved west into the Chukchi Sea. There was no strong variation in the mean ridge height along the coast. There was no systematic areal variation in mean ridge height normal to the coast. There was also no correlation between mean ridge height and the number of ridges per km as has been reported by previous investigators. An analysis was also made of the probability of encountering very large ridges. SLAR imagery gives the size distribution of multi-year ice floes within the nearshore ice pack, and the variation in the areal percentage of deformed ice as a function of distance from the coast. This latter parameter showed a steady decrease as the distance north of the coast increases.

33-1396

**Comparison of sonar and laser profiles along corresponding tracks in the Arctic Ocean.**

Wadhams, P., Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.2, Seattle, University of Washington, 1977, p.43-44, Extended abstract. Full paper as manuscript only. 10 leaves. 15 refs.

**Sea ice, Ice bottom surface, Pressure ridges, Ice acoustics, Aerial reconnaissance, Submarines.**

33-1397

**Modelling pack ice as a viscous-plastic continuum: some preliminary results.**

Hibler, W.D., III, MP 1164, Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.2, Seattle, University of Washington, 1977, p.46-55, 21 refs.

**Pack ice, Viscous flow, Plastic flow, Ice deformation, Ice models, Mathematical models.**

A dynamic-thermodynamic model of pack ice is presented, which treats the ice as a nonlinear viscous continuum characterized by both bulk and shear viscosities and a pressure term with the viscosities being functions of the deformation rate and the pressure. The pressure is parameterized as a function of the compactness and mean thickness of the ice. This formulation allows the viscous continuum approach to be retained while allowing the system to deform in a plastic manner. The model is formulated in a fixed Eulerian grid, and the dynamical equations are coupled to continuity equations for compactness and mean ice thickness which include thermodynamic source and sink terms. In the numerical scheme the dynamical equations of motion, in finite difference form, are integrated implicitly and the ice thickness equations are integrated explicitly. The model is applied to the Arctic Basin and integrated at one-day steps for up to eight years in order to obtain steady state results for both ice thickness and drift. Two cases are examined.

33-1398

**Compactness and thickness effects on drift of Arctic pack ice based on two-phase flow model.**

Pai, S.I., et al, Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.2, Seattle, University of Washington, 1977, p.57-66, 11 refs.

Das, M.M., Li, H.

**Fluid flow, Pack ice, Dynamic properties, Mathematical models, Ice cover thickness.**

33-1399

**Finite element formulation of a sea ice drift model.**

Sodhi, D.S., et al, MP 1165, Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.2, Seattle, University of Washington, 1977, p.67-76, 10 refs.

Hibler, W.D., III.

**Sea ice, Drift, Mathematical models.**

The complete boundary value problem of a linear viscous sea ice drift model is presented, using the finite element method; and the formulation includes the inertial force term in the governing equation of motion. The results of the computations of the steady-state ice velocities in the Arctic Ocean are presented, using mean seasonal geostrophic wind data and available current information. The effect of varying boundary conditions and the viscosity parameters is examined. On a much smaller scale, this model has been applied to the study of non-steady drift of pack ice through the Strait of Belle Isle (between Newfoundland and Labrador) where strong tidal streams and ocean currents move the pack ice back and forth. Using idealized

sinusoidal variations of the tidal streams, it is found that the time lag between the water and the ice velocities is related to the viscosity parameters, which indicates that the ice is not drifting freely; and the boundaries affect the time constant of the simplified first order model of the ice drift through the Strait.

33-1400

**Long range ice forecasting method for the north coast of Alaska.**

Barnett, D.G., Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.2, Seattle, University of Washington, 1977, p.77-86, 2 refs.

**Ice forecasting, Long range forecasting, Meteorological factors.**

33-1401

**Techniques for predicting sea ice.**

Neralla, V.R., et al, Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.2, Seattle, University of Washington, 1977, p.87-97, 16 refs.

Liu, W.S., Venkatesh, S.

**Sea ice, Ice forecasting, Drift, Mathematical models.**

33-1402

**Empirical orthogonal functions and the statistical predictability of sea ice extent.**

Walsh, J.E., Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.2, Seattle, University of Washington, 1977, p.98-107, 14 refs.

**Ice forecasting, Sea ice, Long range forecasting, Mathematical models.**

33-1403

**Operational determination of wind stress on the Arctic pack ice.**

Denner, W.W., et al, Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.2, Seattle, University of Washington, 1977, p.108-119, 11 refs.

Ashim, L.D.

**Sea ice, Pack ice, Wind factors, Ice forecasting, Drift, Mathematical models.**

33-1404

**Effect of sea ice extent on the climatology of the GISS general circulation model.**

Herman, G.F., Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.2, Seattle, University of Washington, 1977, 16 leaves, Full paper as manuscript only. 16 leaves. 13 refs.

**Atmospheric circulation, Climatology, Sea ice distribution, Ice cover effect.**

33-1405

**Seasonal variability of Antarctic sea ice extent: its numerical modeling.**

Kulakov, I.I.U., et al, Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.2, Seattle, University of Washington, 1977, p.121-127, 6 refs.

Maslovskii, M.I., Timokhov, L.A.

**Sea ice, Seasonal variations, Mathematical models, Meteorological factors.**

Thermal factors should be considered in calculations of the antarctic ice edge position to get a good agreement between calculated results and observed positions. Effects of the dynamics of antarctic sea ice are also significant. The mechanism involves concentration changes which, in turn, affect heat fluxes directed towards lateral and bottom ice floe surfaces. The rate of ice melting and freezing in winter is determined by heat balance equations, which also influence the variability of ice concentration. The latter effect on the ice drift speed was not considered. The initial data for the calculations include seasonal climatic data on total radiation, atmospheric pressure, air temperature, and water temperature taken from the Soviet Atlas of the Antarctic. The calculation grid has 1 deg latitudinal step and 5 deg longitudinal step. The results show that consideration of dynamical factors changes the calculated ice edge positions. The largest error of calculations is for the ice edge position in the Weddell Sea. This might be attributed to the insufficient information on heat fluxes coming from the quasi-homogeneous oceanic layer. (Auth.)

33-1406

**Summary of a large-scale sea-ice model.**

Parkinson, C.L., et al, Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.2, Seattle, University of Washington, 1977, p.128-136, 15 refs.

Washington, W.M.

**Sea ice distribution, Ice mechanics, Mathematical models, Ice heat flux.**

A summary is presented of a large-scale numerical model, which has been developed to simulate the annual cycle of sea-ice advance and retreat in both the Arctic and Southern Oceans. The model employs an 8-hour timestep and a rectangular grid with horizontal resolution approximately 190 km. Thermodynamic and dynamic adjustments are calculated sequentially, the thermodynamics being based on energy balances at the top and bottom surfaces of the ice and snow, and the dynamics being based on the following five forces: wind stress, water stress, Coriolis force, the pressure gradient due to the tilting of the sea

surface, and internal ice resistance. Although each grid square is allowed only one ice thickness, each square also has a variable percentage of its area assumed ice-free, thus allowing more realistic ocean-atmosphere exchanges. (Auth.)

33-1407

**Sea ice and ocean energy balance studies at Mawson, Antarctica.**

Allison, I., et al, Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.2, Seattle, University of Washington, 1977, p.137-146, 11 refs.

Akerman, G.

**Sea ice, Heat transfer, Ice heat flux, Polynyas, Heat balance, Antarctica—Mawson Station.**

The present program of year round energy flux and oceanic measurements over sea ice and open water near Mawson, Antarctica, is described. The importance of various terms in the energy balance at different times of year, and the application of these results to the parameterization of surface energy exchanges in the sea ice region is under investigation. Particular emphasis is placed on the study of processes over open water and forming sea ice and on the role of oceanic heat flux in the over-all energy balance. Continuation and expansion of the present studies is planned until and during the FGGE. Preliminary results of the studies are presented. Fluxes of radiation and sensible heat over open water are calculated from measurements made during a twenty-day period in February 1977 and are compared with fluxes measured during February 1970. The measurements cover a period when the net energy budget is changing rapidly from one of heat gain by the water to one of heat loss, and during which heat exchange by turbulence is becoming increasingly important as a method of heat loss by the water prior to ice formation. (Auth.)

33-1408

**Yield and plastic deformation in ice crushing failure.**

Ralston, T.D., Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.2, Seattle, University of Washington, 1977, p.147-156, 13 refs.

**Ice deformation, Plastic deformation, Ice strength, Ice pressure, Offshore structures, Analysis (mathematics).**

33-1409

**Propagation of flexural gravity waves in sea ice.**

Squire, V.A., et al, Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.2, Seattle, University of Washington, 1977, p.157-166, 12 refs.

Allan, A.J.

**Water waves, Wave propagation, Ice sheets, Viscoelasticity, Strain measuring instruments.**

33-1410

**Prediction of heat, mass, and momentum transfer during laminar forced convective melting of ice in saline water.**

Wilson, N.W., et al, Symposium on Sea Ice Processes and Models, Sep. 6-9, 1977. Proceedings, Vol.2, Seattle, University of Washington, 1977, p.167-176, 12 refs.

Sarma, T.S.

**Heat transfer, Mass transfer, Ice melting, Salt water.**

33-1411

**Porous pavement.**

Thelen, E., et al, Philadelphia, Franklin Institute Press, 1978, 98p., 32 refs.

Howe, L.F.

**Pavement bases, Porous materials, Drainage, Soil strength, Ground thawing.**

33-1412

**Reuse of waste water: impact on water supply planning.**

Mangan, G.F., Jr., *International Association of Hydrological Sciences. Bulletin*, June 1978, 23(2), p.235-244, In English with French summary. 8 refs.

**Water supply, Urban planning, Water treatment, Waste disposal.**

33-1413

**Innovations used in pipeline installation under Arctic ice.**

Brown, R.J., *Oil and gas journal*, Nov. 20, 1978, 76(47), p.93-94, 96, 101, 104, 109.

**Pipe laying, Hydraulic structures, Offshore structures, Sleds, Trenching, Ice cover, Ice islands.**

33-1414

**Exxon unveils details of ice island construction. *Oil and gas journal*, Nov. 27, 1978, 78(48), p.40, 42.**

**Ice islands, Artificial ice.**

33-1415

**Frost resistance of concrete with porous aggregate.**

Fagerlund, G., Stockholm, Institute of Technology, Cement and Concrete Research Institute, 1978; 189p., 63 refs.

**Concrete aggregates, Porous materials, Frost resistance, Concrete curing, Freeze thaw tests, Cements, Low temperature tests.**

- 33-1416**  
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Ice jams, Ice forecasting, Aerial reconnaissance, Ice reporting.
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Soil analysis, Soil microbiology, Low temperature research.  
Yeasts were identified from antarctic soil samples. *Cryptococcus* and *Aureobasidium* were widely distributed and were found in the dry valleys. Fewer yeast species were identified from antarctic soils than have been reported previously from aquatic antarctic samples. In some antarctic soils yeasts were the dominant microbial populations. Yeasts from antarctic soils have adaptive features that would allow them to grow and survive under harsh antarctic conditions, but we did not identify 'unique' species of yeasts that do not occur in other regions. (Auth.)
- 33-1448  
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Water supply, Economic development, Icebergs, Weather modification, Iceberg towing.  
Saudi Arabia is engaged in a wide-scale program of seawater desalination. It is also presently considering the use of Antarctic icebergs as a source of freshwater and as a weather modifier. Suitable icebergs can be found in a zone northeast of the Weddell Sea. Means for locating and inspecting them are described. Furthermore, methods for towing such icebergs from the Antarctic to the Aden Gulf and from the Aden Gulf to any Saudi Arabian Coast are discussed. The necessary steps for protection against melting in transit are also explained. An outline of the various proposed techniques to obtain fresh water from icebergs is given. The considerable cold mass of icebergs is a powerful tool for microclimate improvement, especially on hot coastal plains with a high degree of atmospheric humidity. The lowering of the temperature through fog formation could indeed reduce the costly summer peak demands for water and electricity. Economic projections show that the operating costs of water from icebergs delivered to Saudi Arabia compares favorably with water produced by desalination. Investments forecasts favor also the iceberg source. (Auth.)
- 33-1449  
Regularities governing snow cover variations during melting in the high-mountain Varzob River Test Basin. (Zakonomenosti v izmenenii stepeni pokrytiia gornogo basseina snegom v period ego taniia (po materialam aerofotos'emok v opytном vysokogornom basseine r. Varzob)).  
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River basins, Snow cover distribution, Aerial photography, Snow surveys, Snowmelt, USSR—Varzob River.
- 33-1450  
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- 33-1451  
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Moraines, Age determination, Glacial deposits, Paleoclimatology, Glacier movement, Meltwater, Mountain glaciers, United States—Washington—Rainier, Mount.
- 33-1452  
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Nussbaumer, M.  
Soil freezing, Tunneling (excavation), Excavation, Artificial freezing, Stresses, Deformation, Construction.
- 33-1453  
On melting icebergs.  
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Turner, J.S.  
Icebergs, Ice melting, Meltwater, Sea water, Salinity.  
Relative to the feasibility of towing icebergs and melting them to provide fresh water, it has been conjectured that melt water from a penned iceberg will rise, without much mixing, to the surface, where it can be siphoned off for subsequent use. Ne-shyba (1977:31-4205 or F-18611) claims that the melt water will have mixed significantly with its salty environment before reaching the surface. It is suggested that both claims may be in error. In the present experiments it is shown that the melt water mixes with a large volume of salty water and spreads out close to the level at which it is produced, and little, if any, rises to the surface. The vital importance of the salinity gradient is stressed.
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Iceberg sounding by impulse radar.  
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Icebergs, Radar echoes, Sounding, Airborne radar.
- 33-1455  
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- 33-1456  
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Air cushion vehicles, Snow accumulation, Railroad tracks, Snow removal.
- 33-1457  
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Alpine tundra, Alpine vegetation, Tundra vegetation, Vegetation patterns.
- 33-1459  
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- 33-1460  
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Meetings, Hydrology, Meteorology, Flood forecasting, Snow cover, Lake ice, Measurement.
- 33-1461  
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Lake ice, Measurement, Ice surveys, Snow cover effect.
- 33-1462  
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Yu, P.M.  
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- 33-1463  
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- 33-1464  
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Snow evaporation, Wind direction.
- 33-1465  
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Snowmelt, Measuring instruments, Heat transfer, Snow cover, Analysis (mathematics).
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Power, J.M.  
Remote sensing, Snow cover distribution, Spaceborne photography, Photointerpretation.
- 33-1468  
Ecology of northern spruce forests. (Ekologiya el'nikov Severa).  
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DLC AS262.A7133A3, No.32  
Forest soils, Taiga soils, Taiga vegetation, Active layer, Biomass, Roots, Mosses, Ecosystems, Plant physiology, Cryogenic soils, Soil profiles.
- 33-1469  
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Taiga soils, Taiga vegetation, Active layer, Solar radiation, Radiation absorption, Mosses.

33-1470

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Veretennikov, A.V.  
DLC AS262.A7133A3, No.32  
Taiga soils, Ecosystems, Taiga vegetation, Plant physiology, Biomass, Roots.

33-1471

Woody plant biomass in the northern spruce taiga. (Produktivnost' drevesnoi rastitel'nosti elovykh lesov severnoi podzony taigi), Bobkova, K.S., et al, *Ekologiya el'nikov Severa* (Ecology of northern spruce forests) edited by I.V. Zaboieva, Syktyvkar, 1977, p.45-51, In Russian. 15 refs.  
Nadutkin, V.D.  
DLC AS262.A7133A3, No.32  
Taiga soils, Taiga vegetation, Biomass, Ecosystems, Plant ecology, Solar radiation, Swamps, Podsol.

33-1472

Soils of northern spruce taiga. (Pochvy severotaezhnykh el'nikov), Verkholantseva, L.A., *Ekologiya el'nikov Severa* (Ecology of northern spruce forests) edited by I.V. Zaboieva, Syktyvkar, 1977, p.52-84, In Russian. 21 refs.  
DLC AS262.A7133A3, No.32  
Taiga soils, Cryogenic soils, Taiga vegetation, Soil profiles, Soil moisture migration, Podsol.

33-1473

Phytomass of the lower stratum of green-moss forests. (Fitomassa nizhnikh iarusov rastitel'nosti zelenomoshnykh tipov lesa), Tuzhilkina, V.V., *Ekologiya el'nikov Severa* (Ecology of northern spruce forests) edited by I.V. Zaboieva, Syktyvkar, 1977, p.85-92, In Russian. 15 refs.  
DLC AS262.A7133A3, No.32  
Taiga soils, Taiga vegetation, Mosses, Biomass.

33-1474

Methods of long range forecasting of dates of ice appearance on rivers of the northwestern USSR. (Metodika dolgosrochnogo prognoza srokov poiyavleniya l'da na rekakh Severo-Vostoka SSSR), Savchenkova, E.I., *Leningrad. Gidrometeorologicheskii nauchno-issledovatel'skii tsentr. Trudy*, 1977, Vol.186, p.71-77, In Russian. 5 refs.  
Ice forecasting, Long range forecasting, Freezing, River ice, Ice reporting.

33-1475

Long range forecasting of ice breakup on the Lena and Yenisey rivers. (Metod dolgosrochnogo prognoza srokov vskrytiia rek Leny i Eniseia), Efremova, N.D., et al, *Leningrad. Gidrometeorologicheskii nauchno-issledovatel'skii tsentr. Trudy*, 1977, Vol.186, p.78-87, In Russian. 5 refs.  
Karakash, E.S.  
Ice breakup, Ice forecasting, Ice jams, Ice reporting, USSR—Lena River, USSR—Yenisey River.

33-1476

Expanding the term of short range forecasts of ice breakup on rivers of the North European USSR. (O putiakh uvelicheniya zablago vremennosti kratkosrochnogo prognoza vskrytiia rek severa Evropeiskoi territorii SSSR), Silant'eva, T.P., *Leningrad. Gidrometeorologicheskii nauchno-issledovatel'skii tsentr. Trudy*, 1977, Vol.186, p.88-92, In Russian. 8 refs.  
Ice breakup, Ice forecasting, Ice cover strength, Ice cover thickness, River ice, Analysis (mathematics).

33-1477

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Ice cover thickness, Ice structure, Ice growth, River ice, Analysis (mathematics).

33-1478

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33-1494

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- 33-1519**  
Effect of inundation on vegetation at selected New England flood control reservoirs. McKim, H.L., et al, MP 1169, Symposium on Remote Sensing for Vegetation Damage Assessment, February 1978. Proceedings, 1978, 13p., 13 refs. Gatto, L.W., Merry, C.J., Cooper, S. Remote sensing, Infrared photography, Vegetation patterns, Damage, Flooding. The effect of inundation on vegetation caused by the regulation and impoundment of water at six New England flood control reservoirs during a June-July 1973 flood was assessed from color infrared photography and corroborative ground surveys. Percent of damaged trees was assessed on a pattern recognition and coloration basis. Correlative ground truth data showed that the deciduous trees, particularly silver maple and red oak, were least affected and that coniferous trees, especially white pine, were most affected by salination and inundation. Much of the understory vegetation, i.e., American and Eastern hop hornbeam, lost all leaves after inundation, but new buds and shoots appeared by late September 1973. A critical relationship, determined from ground transect profiles showing the relationship between species susceptibility and inundation time, was that trees completely covered by flood waters for more than 90 hours showed the most apparent damage.

33-1520

**Preferred crystal orientations in the fast ice along the margins of the Arctic Ocean.**Weeks, W.F., et al, *U.S. Army Cold Regions Research and Engineering Laboratory*, June 1978, CR 78-13, 24p., ADA-059 024, 77 refs.

Gow, A.J.

**Sea ice, Fast ice, Ice crystal structure, Crystal orientation, Ocean currents.**

Field observations of the growth fabrics of the fast and near-fast ice along the coasts of the Beaufort and Chukchi Seas show that, at depths of more than 60 cm below the upper ice surface, the sea ice crystals show striking alignments within the horizontal plane. In general, the c-axes of the crystals were aligned roughly E-W parallel to the coast. In the vicinity of islands the alignment roughly paralleled the outlines of the islands, and in narrow passes between islands the alignment paralleled the channel. Our observations, as well as similar observations made in the Kara Sea by Cherepanov, can be explained if it is assumed that the c-axes of the crystals are aligned parallel to the "long-term" current direction at the sea ice/sea water interface. The alignments are believed to be the result of geometric selection among the growing crystals, with the most favored orientation being that in which the current flows normal to the plates of ice that make up the dendritic ice/water interface characteristic of sea ice.

33-1521

**On the determination of horizontal forces a floating ice plate exerts on a structure.**Kerr, A.D., *U.S. Army Cold Regions Research and Engineering Laboratory*, Aug. 1978, CR 78-15, 9p., ADA-060 444, 26 refs. For this report from a different source see 32-4451.**Floating ice, Ice pressure, Loads (forces), Offshore structures, Ice strength.**

This report first discusses the general approach for calculating horizontal forces an ice cover exerts on a structure. Ice force determination consists of two parts: (1) the analysis of the in-plane forces, assuming that the ice cover remains intact, and (2) the use of a failure criterion, since an ice force cannot be larger than the force capable of breaking up the ice cover. For an estimate of the largest ice force, an elastic plate analysis and a failure criterion are often sufficient. A review of the literature revealed that, in the majority of the analyses, it is assumed that the failure load is directly related to a "crushing strength" of the ice cover. However, observations in the field and tests in the laboratory show that in some instances the ice cover fails by buckling. This report reviews the ice force analyses based on the buckling failure mechanism and points out their shortcomings. The report then presents a new method of analysis which is based on the buckling mechanism.

33-1522

**Shoreline changes along the outer shore of Cape Cod from Long Point to Monomoy Point.**Gatto, L.W., *U.S. Army Cold Regions Research and Engineering Laboratory*, July 1978, CR 78-17, 49p., ADA-060 297, 52 refs.**Shoreline modification, Aerial photography, Photointerpretation.**

This investigation utilized historical and recent aerial photographs and satellite imagery in 1) estimating changes in positions of the high-water line and sea cliff break and base, in rates of accretion and/or erosion, and in volumes of transported sediment, and 2) providing a preliminary evaluation of the direction of littoral transport along the outer Cape Cod coast. This investigation has illustrated a photo interpretation technique that is useful in performing a reconnaissance of coastal change. The data obtained from this method can be used to supplement those acquired by ground surveys and are valid as first approximations for planning subsequent, more detailed surveys.

33-1523

**Estuarine processes and intertidal habitats in Grays Harbor, Washington: a demonstration of remote sensing techniques.**Gatto, L.W., *U.S. Army Cold Regions Research and Engineering Laboratory*, July 1978, CR 78-18, 79p., ADA-061 823, 49 refs.**Estuaries, Shoreline modification, Remote sensing, Aerial photography, Spaceborne photography, Tidal currents, Sedimentation, Mapping.**

The primary objective of this project was to demonstrate the utility of remote sensing techniques as an operational tool in the acquisition of data required by the U.S. Army Corps of Engineers, Seattle District, in the Grays Harbor dredging effects project, and related projects. Aerial imagery was used to map surface circulation and suspended sediment patterns near the hopper dredge pump site at the harbor entrance and near pulp-mill outfalls in Aberdeen, and to map the areal distribution and extent of intertidal habitats. The surface circulation maps, prepared from the aerial photographs and thermal imagery, compared favorably with the large-scale circulation patterns observed in the Grays Harbor hydraulic model at the U.S. Army Engineer Waterways Experiment Station. Of the imagery provided by NASA, the thermal imagery was more useful than the color or color infrared (CIR) photographs for mapping circulation, while the CIR photographs were more useful than the thermal imagery or the color photographs for mapping intertidal habitats. Current velocities estimated from dye dispersion patterns and drifting dye drogues were comparable at some locations to velocities measured by *in situ* current meters and in the hydraulic model. Based on a cursory evaluation of LANDSAT-1 imagery acquired in January, February, and October

1973, it had limited utility in providing data on surface circulation patterns in Grays Harbor.

33-1524

**Primary productivity in sea ice of the Weddell region.** Ackley, S.F., et al, *U.S. Army Cold Regions Research and Engineering Laboratory*, July 1978, CR 78-19, 17p., ADA-059 344, 24 refs.

Taguchi, S., Buck, K.R.

**Sea ice, Ice cores, Biomass, Weddell Sea.**

Physical and biological measurements were made of sea ice cores taken from 68S to 78S in the Weddell Sea. Fluorescence measurements indicated an algal community that was strongly associated with salinity maxima within the ice. Maximum concentration of chlorophyll *a* ranged from 0.306 to 4.54 mg/stere. Comparisons with the water column standing crop indicated that the standing crop within the ice represents a minor but significant percentage of the total standing crop for the region. The ice algal community is apparently distinct from others that have been described for land-fast ice in McMurdo Sound, sea ice in the Arctic and pack ice off East Antarctica. The highest concentrations of biological material are found in the bottom or top of the sample in those regions, whereas the Weddell Sea samples are concentrated at intermediate depths (65 m to 215 m) within the ice. A qualitative model indicating the relationship between thermally-induced brine migration and subsequent algae growth is presented. This model indicates the distribution of algae within the ice is dependent on the unique thermal and physical setting for Weddell Sea pack ice where brine drainage processes are initiated by spring and summer warming, but are not carried through as completely as in other regions. (Auth.)

33-1525

**Measurement and identification of aerosols collected near Barrow, Alaska.**Kumai, M., *U.S. Army Cold Regions Research and Engineering Laboratory*, July 1978, CR 78-20, 6p., ADA-058 606, 9 refs.**Aerosols, Particle size distribution, Electron microscopy.**

Measurements of the concentrations of Aitken nuclei in maritime air were made near Barrow, Alaska, in June 1975, with a modified Nolan-Pollack small-particle detector. The concentrations varied from 50 to 300 particles/cu cm, depending upon meteorological conditions. The mean Aitken nuclei count was 100 particles/cu cm for diameters greater than .002 microns. Transmission electron micrographs of aerosols in maritime air near Barrow were taken. The size range was measured to be 0.01 to 2.5 microns in diameter, with the most frequently observed diameter being 0.04 microns. The volume of the maritime air and the collection efficiency of aerosol particles on filmed grids for electron microscopy were measured. The aerosol concentrations were found to be 76 to 101 particles/cu cm; the mean concentration was calculated to be 87 particles/cu cm. The aerosol particles in the maritime air were identified by electron microscopy and selected area electron diffraction analysis. About 20% of the aerosol particles were identified, and 80% of the particles were too small for electron diffraction analysis.

33-1526

**Performance of the St. Marys River ice booms, 1976-77.**Perham, R.E., *U.S. Army Cold Regions Research and Engineering Laboratory*, Sep. 1978, CR 78-24, 13p., ADA-061 431, 5 refs.**Ice booms, Ice pressure, Ice navigation, Cold weather performance.**

The ice booms on the St. Marys River at Sault Ste. Marie, Michigan and Ontario, were operated a second winter, 1976-77, under colder conditions, with less water flow, lower water levels, and 25% fewer ships in the river than during the previous year. The ice cover behind the booms remained frozen to shore for longer periods, and the loads registered in the booms were relatively unaffected by ship passages compared with the previous year's activity. As in the previous year, most structural load changes took place in the west ice boom and were due to movements of the ice cover immediately upstream of the boom. The cover broke free from shore on three occasions: the first and third occasions were minor events, but on the second occasion the cover cracked free, the timbers remained frozen to it, and the boom structure became damaged by the subsequent ice activity. Three anchor line assemblies broke over a period of about 4 hours; the two latter breaks occurred while a ship was operating in the ice. These events point out several factors to be considered in ice booms, such as designing the booms to withstand the action of the solid ice cover as well as the fragmented ice cover, keeping the structures and their assembly simple, and inspecting components and assemblies carefully.

33-1527

**River channel characteristics at selected ice jam sites in Vermont.**Gatto, L.W., *U.S. Army Cold Regions Research and Engineering Laboratory*, Oct. 1978, CR 78-25, 52p., ADA-061 778, 30 refs.

**Ice jams, Channels (waterways), Remote sensing, Photointerpretation, Topographic features, River ice.** The objectives of this investigation were to describe channel characteristics and geographic settings of ice jam sites from aerial photographic interpretation, to indicate which characteristics may be important in causing ice jams, and to suggest additional uses of aerial photographs. Uncontrolled photomosaics of each site were assembled and major river characteristics were delineated on the photomosaics. Characteristics described include: man-made structures, falls, rapids,

changes in channel depths, channel islands, mid-channel shoals or bars, river bed material, river sinuosity, meanders, floodplain width, riparian vegetation, and types of development on the floodplain. River channel widths were measured from the photograph along rivers where ground truth data were available for comparison. Lengths of channel riffles and pools were measured along the rivers where variations in river depths were evident on the photographs. Aerial photographs provide a regional perspective for evaluating channel characteristics at an ice jam site and for analyzing the geographic setting at each site during ice-free conditions. Photographs taken after ice jams have formed are useful in monitoring ice jam formation, in analyzing ice characteristics, and in documenting ice jam breakup and movement.

33-1528

**Fate and effects of crude oil spilled on permafrost terrain. Second annual progress report, June 1976 to July 1977.**McFadden, T., et al, *U.S. Army Cold Regions Research and Engineering Laboratory*, Dec 1977, SR 77-44, 46p., ADA-061 779, 4 refs. Includes progress report for the first year, CRREL SR 76-15, q.v. 32-1257.**Oil spills, Damage, Chemical reactions, Frozen ground, Environmental impact, Vegetation.**

This spill was compared with one that took place in February 1976 (reported upon in the first annual progress report). Oil moved downslope at a much faster rate during the summer spill than during the winter spill. In the winter the oil cooled and pooled rapidly. The summer spill covered approximately one-third more surface area than did the winter spill in the final configuration, even though the two spills were of almost identical volume. Increases in microbial populations and activities during the months following the spill were evident. Increased counts of bacteria, yeasts, denitrifying bacteria, and petroleum-degrading bacteria following the spills were particularly evident. Analysis of oil decomposition using gas chromatography techniques indicated that the low molecular weight fractions, methane and ethane, were lost almost immediately after the spill in each case. Fractions in the C3 to C9 range were reduced significantly in two months and were nearly zero at the end of five months. An obvious adverse effect on vegetation was noted in both spills. Biological damage from the summer spill appeared to exceed that from the winter spill.

33-1529

**Experimental device for measuring friction between ski and snow.**Keinonen, J., *Acta polytechnica Scandinavica. Applied physics series*, 1978, No.123, 11p., 7 refs.**Friction, Snow surface, Skis, Coefficients.**

33-1530

**Distinctive sedimentary features of cold-climate eolian deposits, North Park, Colorado.**Ahlbrandt, T.S., et al, *Palaeogeography, palaeoclimatology, palaeoecology*, Nov. 1978, 25(4), p.327-351, 18 refs.

Andrews, S.

**Eolian soils, Sands, Sedimentation, Soil freezing, Freeze thaw cycles, Snow cover effect.**

33-1531

**Geochemical methods of ore prospecting in cryogenic regions.**Pitul'ko, V.M., et al, *International geology review*, Oct. 1978, 20(10), p.1157-1166, Translation of Sovetskaya geologiya 3:94-107, 1977. 23 refs.

Shvartsev, S.L.

**Minerals, Geochemistry, Exploration, Frozen ground chemistry.**

33-1532

**Calculated snowpack evaporation during chinooks along the eastern slopes of the Rocky Mountains in Alberta.**Golding, D.L., *Journ. of applied meteorology*, Nov. 1978, 17(11), p.1647-16, 11 refs.**Snow evaporation, Mountains, Wind (meteorology).**

33-1533

**Numerical simulation of pre-ice-nucleation conditions in a settling cloud chamber.**Weickmann, K.M., et al, *Journal of applied meteorology*, Nov. 1978, 17(11), p.1667-1679, 29 refs.

Barchet, W.R.

**Mathematical models, Ice nuclei, Ice crystal nucleation, Artificial nucleation, Cloud chambers.**

33-1534

**Recommendations for implementing roof moisture surveys in the U.S. Army.**U.S. Army CRREL/WES/FESA Roof Moisture Research Team, *U.S. Army Cold Regions Research and Engineering Laboratory*, Aug. 1978, SR 78-1, 8p., ADB-031 978L, Distribution limited to U.S. Government agencies only.**Moisture meters, Roofs, Infrared reconnaissance, Site surveys.**

Nuclear, infrared, capacitance, microwave and impulse radar methods for non-destructively detecting moisture in roofs were evaluated. No system was reliable enough by itself or by cross-checking with another system to eliminate the need for a few

core samples of membrane and insulation to verify findings. Airborne infrared surveys are a cost-effective way of reconnoitering numerous roofs at a major installation. However, follow-up on-the-roof surveys are necessary. Of the several grid techniques examined, nuclear surveys were the most reliable. Hand-held infrared surveys are the most accurate on-the-roof method studied. Although an infrared camera costs significantly more than a nuclear meter (\$25K vs \$3K), infrared surveys can be conducted more rapidly. Since the Army has numerous roofs to survey, infrared surveys appear to be the most cost-effective method. For reasons of continuity, accuracy and economy, the Army should establish its own capability to survey roofs for moisture. Implementation should not be at the installation level. A centralized team of roof moisture surveying specialists, skilled in operating infrared equipment but, more importantly, skilled in roofing technology, should be established. The team should both conduct and contract for airborne and on-the-roof infrared surveys. The CRREL/WES/FESA roof moisture research group has initiated development of training aids for use by such a team.

### 33-1535

**Construction equipment problems and procedures: Alaska pipeline project.**

Hanamoto, B., *U.S. Army Cold Regions Research and Engineering Laboratory*, June 1978, SR 78-11, 14p., ADB-029 226, 4 refs. Distribution limited to U.S. Government agencies only.

**Cold weather performance, Construction equipment, Pipelines, Engines, Human factors.**

The Trans-Alaska pipeline construction project posed many problems which are not encountered in the more temperate regions. Construction equipment maintenance and operation is of major concern in the far north. Difficulties encountered were due to: extreme low temperature of -70F (-57C) and common winter temperatures of -30F (-34C), the remoteness and isolation of the work area, harsh environment, and the working personnel. This report describes some of the typical problems encountered with construction equipment on this project and some of the remedies and procedures for solving these problems.

### 33-1536

**Soil lysimeters for validating models of wastewater renovation by land application.**

Iskandar, I.K., et al., *U.S. Army Cold Regions Research and Engineering Laboratory*, June 1978, SR 78-12, 11p., ADA-059 994, 12 refs.

**Moisture meters, Water treatment, Waste disposal, Models.**

This report describes the construction, operation and performance of large-scale (90 cm inside diameter and 150-cm-high) lysimeters. These lysimeters can continuously monitor soil moisture flow, soil temperature and redox potential with depth, and sample soil water and soil air with depth. The rate of soil water movement to the groundwater was continuously monitored by a rain gage and a recorder. To simulate field condition, an automatic spray system was developed; this system is also described in this report. The total cost of one lysimeter is approximately \$650 (1975 estimate). The lysimeters are being used to validate a biophysical-chemical model of wastewater renovation by application to land. Detailed blueprints of the lysimeters are kept at CRREL and are available on request.

### 33-1537

**Ecological baseline investigations along the Yukon River-Prudhoe Bay haul road, Alaska.**

Brown, J., ed., *U.S. Army Cold Regions Research and Engineering Laboratory*, Sep. 1978, SR 78-13, 131p., ADA-060 255. For this item as a progress report to the U.S. Department of Energy and for individual papers see 32-3888 through 32-3896.

**Research projects, Ecology, Tundra vegetation, Roads, Clay soils.**

Results of the first full year's field research on five projects along the Yukon River-Prudhoe Bay Haul Road are reported. Several projects are extensions of investigations begun in 1976 and are being conducted in cooperation with a Federal Highway Administration sponsored environmental engineering study. The extent and success of weeds and weedy species along the road and in material sites has been followed for summer 1976 and 1977. In order to document the vegetation along the complex elevational and latitudinal gradient and its potential for impact and recovery, 17 vegetation maps have now been completed, and vegetation described and plots established at 120 locations along the 600-kilometer-long road. Collections of vascular plants, bryophytes and lichens were made and catalogued for an additional 9 sites. Sampling for soil invertebrates to determine their sensitivity to impact was undertaken at approximately 25 sites. A detailed study of the impact of road dust upon the vegetation was initiated at one tundra site, and four sites were established to monitor the amount of dust transported onto the tundra across 1000-meter-long transects. The clay mineralogy and chemistry of the dust and road material were investigated.

### 33-1538

**Radar studies of Arctic ice and development of a real-time Arctic ice type identification system: final report.**

Jean, B.R., *Texas A and M University, College Station. Remote Sensing Center. Report*, Jan. 31, 1976, RSC-3005-6, 34p., ADA-025 739.

**Sea ice, Radar echoes, Remote sensing, Classifications.**

### 33-1539

**Radar studies of Arctic ice and development of a real-time Arctic ice type identification system: progress report, Sep. 1974-Jan. 1975.**

Jean, B.R., et al., *Texas A and M University, College Station. Remote Sensing Center. Report*, Jan. 31, 1975, RSC-3005-5, 110p., ADA-025 862.

**Reisor, G.J., Shay, M.T., Permenter, J.A. Sea ice, Radar echoes, Remote sensing, Classifications.**

### 33-1540

**Systems for Arctic spill response.**

Schultz, L.A., et al., *U.S. Coast Guard. Report*, Mar. 1978, USCG-D-44-78, 2 vols., ADA-058 782, ADA-058 783, Vol.1 contains the main body of the report while Vol.2 holds appendices.

**Deslauniers, P.C., DeBord, F.W., Voelker, R.P. Oil spills, Countermeasures, Waste disposal, Pipelines, Cold weather operation, Sea ice, Tanker ships, Cost analysis.**

### 33-1541

**Roof construction under wintertime conditions: a case study.**

Bennett, F.L., *U.S. Army Cold Regions Research and Engineering Laboratory*, Nov. 1978, SR 78-24, 34p., ADA-062 519.

**Roofs, Cold weather construction, Insulation, Construction materials.**

This report describes construction of the roof of an addition to the Interior City Branch of the First National Bank of Anchorage, located in downtown Fairbanks, Alaska, during the 1976-77 winter. The report documents the schedule and procedure for building the roof, reports successful performance of the roof to date, and presents some general comments on roof construction in the wintertime.

### 33-1542

**Climatic survey at CRREL in association with the land treatment project.**

Billelo, M.A., et al., *U.S. Army Cold Regions Research and Engineering Laboratory*, Nov. 1978, SR 78-21, 37p., ADA-062 518, 39 refs.

**Bates, R.E. Microclimatology, Waste disposal, Water treatment, Waste treatment, Meteorological data.**

During 1972, six test cells were constructed at CRREL for the purpose of studying application of wastewater on various soil types and vegetation. In conjunction with this program, a meteorological observing station was established in order to obtain basic information on the climate proximate to the test cells. This report describes the equipment and its installation, and provides a daily tabulation of the following observed parameters: maximum and minimum air temperatures, relative humidity, dew point, wind speed and direction, precipitation amounts, depth of snow on the ground, solar radiation and pan evaporation. The meteorological data collected during the period starting Oct. 1, 1972, to Mar. 31, 1974, were then summarized; and the results are presented in a series of graphs and line diagrams. The meteorological parameters recorded at CRREL were then examined to determine how weather can constrain or help year-round operation of wastewater application to the land. The positive and negative effects of air temperature, precipitation, wind speed, evaporation and snow cover, with respect to land treatment of wastewater, were evaluated. Although no specific recommendations or conclusions are given, the influences of these climatic elements as observed at the CRREL wastewater site are presented for consideration.

### 33-1543

**Geochemistry of subsea permafrost at Prudhoe Bay, Alaska.**

Page, F.W., et al., *U.S. Army Cold Regions Research and Engineering Laboratory*, Sep. 1978, SR 78-14, 70p., ADA-060 434, Refs. p.62-68.

**Iskandar, I.K. Submarine permafrost, Sediments, Sea water, Chemical analysis, Drill core analysis, Salinity.**

The analytical data from sediment, interstitial water, and seawater analyses of samples collected near Prudhoe Bay, Alaska, during the period from March to May 1977, are presented. Analyses include determinations of moisture, calcium carbonate, and organic carbon contents in the sediment samples and pH, electrical conductivity, alkalinity, and concentrations of sodium, potassium, calcium, magnesium, chloride, and sulfate in the interstitial water and seawater samples. Salinity, ionic balance, and freezing point of the water samples were calculated. The marine sediments in Prudhoe Bay generally contain more calcium carbonate, organic carbon, and interstitial water than the underlying glacial and fluvial gravels. On land, a surficial layer of peat also had high organic carbon and moisture contents. The salinity of the seawater samples varied from concentrated brines near the shore where sea ice is frozen directly to, or is located near, the sea bottom to water which was 1.0 to 1.5 ppt less saline than normal seawater at a distance of approximately 10 to 15 km from shore.

### 33-1544

**Waterproofing strain gages for low ambient temperatures.**

Garfield, D.E., et al., *U.S. Army Cold Regions Research and Engineering Laboratory*, Sep. 1978, SR 78-15, 20p., ADA-061 749, 10 refs.

**McLain, B.G. Strain measuring instruments, Low temperature tests, Freeze thaw cycles, Waterproofing.**

Due to recent problems experienced with strain-gage based transducers immersed in water at below-freezing ambient temperatures, a test program was conducted to determine if commercially available strain-gage waterproofing systems could withstand these conditions. A total of 96 combinations of eight waterproofing systems, three beam materials and four strain gage adhesives were evaluated. Test environments included strain cycling at temperatures from +32F to +75F and freeze-thaw cycling from -35 to +90F. Only one waterproofing system withstood all tests with no failures. Other results ranged from one installation failure on three systems to the failure of all 12 installations of one system.

### 33-1545

**Effects of low ground pressure vehicle traffic on tundra at Lonely, Alaska.**

Abele, G., et al., *U.S. Army Cold Regions Research and Engineering Laboratory*, Sep. 1978, SR 78-16, 63p., ADA-061 777, 18 refs.

**Walker, D.A., Brown, J., Brewer, M.C., Atwood, D.M. Tundra vegetation, Tires, Soil trafficability, Damage.**

Traffic tests were conducted with two low-pressure-tire Rolligon-type vehicles and a small, tracked Nodwell for 1, 5, and 10 vehicle passes on tundra near Lonely, Alaska. The traffic impact was limited to compression of the vegetation and the organic mat and a maximum terrain surface depression of several centimeters, with virtually no shearing or disaggregation of the mat. After one year, the visibility of the traffic signatures had increased, surface depression remained the same, and the thaw depth below the multiple pass tracks had increased a few centimeters.

### 33-1546

**Effects of winter military operations on cold regions terrain.**

Abele, G., et al., *U.S. Army Cold Regions Research and Engineering Laboratory*, Sep. 1978, SR 78-17, 34p., ADA-061 260.

**Johnson, L.A., Collins, C.M., Taylor, R.A. Cold weather operation, Military operation, Damage, Environmental impact, Vegetation.**

Observations were made on the 1977 winter military maneuver sites south of Fairbanks to obtain base line data for monitoring terrain and vegetation recovery from the impact of winter trail preparation, and vehicular and troop activities in various terrains and vegetation types.

### 33-1547

**Need for ice-going vessels intensifies as polar mineral research increases. Shipping world and shipbuilder, Apr. 1976, 169(3916), p.325-337.**

**Icebreakers, Ice breaking, Tanker ships.** This series of six short, anonymous articles reviews international aspects of icebreaking and icebreakers.

### 33-1548

**Use of blast furnace slag as a stabilizer in earth constructions. (Masuunikuonan käyttämisestä stabiliaattorina maarakenteissa).**

Taivainen, O.A., *Oulun yliopisto. Tie- ja maarakennustekniikan laitos. Julkaisu*, 1978, No.26, 23p., In Finnish with English summary. 2 refs.

**Moraines, Soil stabilization, Cement additives.**

### 33-1549

**Heat measurement in shallow foundations of apartment houses in Kajaani and Tornio, 1975-1977. (Kerrostalojen matalaperustusten lämpötilamittauksia Kajaanissa ja Torniossa 1975-1977).**

Aho, O.K., et al., *Oulun yliopisto. Tie- ja maarakennustekniikan laitos. Julkaisu*, 1977, No.25, 54p., In Finnish.

**Putala, J. Heat transfer, Heat measurement, Foundations, Residential buildings.**

### 33-1550

**Frost protection for shallow foundations. (Matalaperustusten routasuojaus).**

Aho, O.K., *Oulun yliopisto. Tie- ja maarakennustekniikan laitos. Julkaisu*, 1977, No.24, 115p., In Finnish. 28 refs.

**Heat transfer, Frost protection, Soil mechanics, Frozen ground, Buildings, Foundations, Heat loss.**

- 33-1551**  
Modeling of rocks with mixed conductivity for the description of electric polarization. (K printsipam modelirovaniia gornoi porody so smeshannoi provodimost'iu pri opisaniu elektricheskoi polarizatsii, Gennadnikov, B.I., et al, *Akademiia nauk SSSR. Doklady*, Oct. 1976, 230(4), p.807-810, In Russian. 11 refs.  
Mel'nikov, V.P., Mel'nikov, P.I.  
Rocks, Electrical resistivity, Models.
- 33-1552**  
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Permafrost distribution, Ground ice, Permafrost structure, Ice structure, Cryogenic processes, Cryogenic formations, Maps, Soil mapping, Geological maps, Permafrost hydrology, USSR—Yakutia.
- 33-1553**  
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DLC GB1005.S65  
Geothermy, Permafrost distribution, Frozen rock temperature, Permafrost thermal properties, Heat transfer, Mass transfer, Analysis (mathematics).
- 33-1554**  
Depth of frost penetration into the upper zone of the crust in Yakutia. (O glubine promerzaniia verkhnei zony zemnoi kory na territorii IAkutskoi ASSR), Mel'nikov, P.I., Soveshchanie po geotermicheskim issledovaniyam v SSSR, 2nd, Moscow 1964. Trudy (Second conference on geothermal investigations in the USSR, Moscow, 1964. Proceedings), Moscow, Nauka, 1966, p.110-113, In Russian.  
DLC GB1005.S65  
Permafrost distribution, Active layer thickness, Geothermy, Frozen rock temperature, USSR—Yakutia.
- 33-1555**  
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DLC GB1005.S65  
Geothermal thawing, Glacier ice, Ice cover thickness, Ice bottom surface, Ice melting.
- 33-1556**  
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- 33-1557**  
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Continuous permafrost, Discontinuous permafrost, Research projects, Expeditions, Permafrost structure, Permafrost physics, Cryogenic soils, Ground ice, Ice structure, Permafrost hydrology, USSR—Yakutia.
- 33-1558**  
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DLC TA713.A435  
Buildings, Foundations, Permafrost beneath structures, Reinforced concrete, Design.
- 33-1559**  
Construction conditions in the Mirnyi village area in Yakutia. (Uslovia stroitel'stva v raione pos. Mirnogo IAkutskoi ASSR), Volkovskii, K.F., et al, *Akademiia nauk SSSR. Institut merzlotovedeniia. Severo-Vostochnoe otdelenie. Trudy*, 1958, Vol.1, p.21-28, In Russian.  
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- 33-1560**  
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- 33-1561**  
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Pile foundations, Permafrost beneath structures, Shear strength, Low temperature tests, Laboratory techniques.
- 33-1562**  
Experience in starting water systems in freezing weather in Yakutia. (Opyt puskia vodovoda v g. IAkutskoe v zimnee vremia), Ogurtsova, G.A., et al, *Akademiia nauk SSSR. Institut merzlotovedeniia. Severo-Vostochnoe otdelenie. Trudy*, 1958, Vol.1, p.46-51, In Russian.  
Paul'son, A.A.  
DLC TA713.A435  
Water pipelines, Permafrost beneath structures, Cold weather operation, USSR—Yakutia.
- 33-1563**  
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- 33-1564**  
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Artificial freezing, Cooling systems, Frozen rock temperature, Measuring instruments, Borehole instruments.
- 33-1565**  
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- 33-1566**  
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Roadbeds, Roads, Permafrost beneath structures, Design.
- 33-1567**  
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- 33-1568**  
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Permafrost thickness, Active layer thickness, Surface waters, Permafrost hydrology, Ground water, Taliks, Permafrost beneath rivers.
- 33-1569**  
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Ground ice, Permafrost beneath rivers, Thermokarst, Permafrost structure, Taliks, Submarine permafrost, Permafrost hydrology, Laptev Sea, USSR—Yana River.
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- 33-1571**  
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- 33-1572**  
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- 33-1573**  
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Electrical resistivity, Aerial surveys, Very low frequencies, Topographic effects, Electric fields.  
Airborne wavellit resistivity surveys and profiles at VLF have been analyzed for the effects of topography, altitude, and wave-tilt phase and amplitude. Topographic relief is known to affect at least one electric field component, flight altitude often varies over relief, and phase depends on the earth's resistivity stratification and the relative strength of displacement to conduction current. A mountainous area in northern Maine of predominantly slate, but containing an igneous stock, was surveyed at

150 m mean flight altitude. The 150-m survey was repeated at 300 m and two of the 150-m flight lines were repeated at a total of three other altitudes. A comparison of the 150-m survey with the topography and with the 300-m survey revealed that although most of the resistivity information of the 150-m survey was retained at 300 m, serious differences arose due to topographic influences. Profiles of the individual electric field components at the various altitudes then revealed that topography was distorting resistivity values through its effect upon only the vertical component of the electric field. The separate influences of phase and amplitude were analyzed using the results of a ground survey of the total, complex surface impedance. The phase of the tilt proved to be important in the airborne differentiation of the rock types.

**33-1574**  
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Remote sensing, Construction materials, Geologic structures.

Fourteen surficial geology units were delineated in a 2250 sq km area in northern Maine. These units included: alluvial fan, alluvial terrace, esker, floodplain, glacial moraine, kame, kame terrace, outwash, outwash terrace, bedrock, till, till over bedrock, wet outwash and wet till. The surficial geology units were field checked and then updated from the field reconnaissance. The depths of the surficial geology units were estimated utilizing borehole data, field measurements and seismometer data. The areal extent of each surficial geology unit was quantified, using a planimetric color densitometer. The volumes of construction material were computed based upon these areal determinations and estimated depths. The volume estimates, compared with the estimates of required construction material, showed that more material could be found within the prescribed area around the dam and dike sites than was required for construction. It is believed that the east- and northeast-trending lineaments in this area are thrust faults dipping 45 deg to the northeast. The north-trending and N60W lineaments are probably strike-slip normal and reverse faults dipping 80 deg to nearly vertical. Future movement along these faults should be negligible.

**33-1585**  
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**33-1588**  
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Studies of a number of different climate system models with widely varying degrees of complexity have led to the following conclusions. The largest single effect of human activities on climate is due to the increase in atmospheric carbon dioxide concentration resulting from burning fossil fuels. Virtually all of the other major activities of mankind also contribute to warming of the lower atmosphere, i.e., through injection into the atmosphere of airborne particles and of other trace gases (i.e., chlorofluoromethanes, nitrous oxide, etc.), and through the direct addition of heat. A best estimate of the resultant warming of the mean surface temperature of the earth due to human activities is about 1°C by 2000 A.D. and about 3°C by 2050 A.D., with an uncertainty of roughly a factor of two. Warming of the polar regions is expected to be three to five times greater than the global average. The warming would almost certainly have a major influence on the extent of arctic and antarctic sea ice, and would eventually cause a change in the total volume of the major ice sheets of Greenland and the Antarctic, but the corresponding change in sea level cannot yet be predicted. Areas of recommended climate research are outlined.

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- 33-1613  
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- 33-1614  
Hydrometeorological conditions of icing of seagoing ships. (Gidrometeorologicheskie uslovia obledeneniia morskikh sudov). Vasil'eva, G.V., *Leningrad. Gidrometeorologicheskii nauchno-issledovatel'skii tsentr. Trudy*, 1971, Vol.87, p.82-92, In Russian. 5 refs. Translation by J. Lindsay, UK Meteorological Office Translation No.848, available from British Lending Library.  
Ship icing, Ice accretion, Ice crystal structure, Icing rate, Meteorological factors.
- 33-1615  
Measurement of Be-10 in 1,000- and 5,000-year-old antarctic ice. Raisbeck, G.M., et al, *Nature*, Oct. 26, 1978, 275(5682), p.731-733, 13 refs.  
Yiou, F., Francau, M., Lieuvain, M., Loiseaux, J.M.  
Ice cores, Isotope analysis, Spectroscopy, Ice composition.  
This paper reports the use of the nuclear accelerator spectrometry technique for the determination of Be-10 concentrations in ice samples from Dome C believed to be about 1,000 and 5,000 yr old. The sample preparation is described. Measurements were made using the external ion source of the cyclotron. Ice samples were analyzed by comparing their Be-10/Be-9 ratio to those of standardized Be-10/Be-9 samples. Using an estimated annual precipitation rate of 3.7 cm of water at the sample site, the average Be-10 concentration (26,000 atoms per g ice) represents a Be-10 deposition rate of 1/3100 atoms/sq cm/s. This is much less than the value of 1/200 atoms/sq cm/s measured at a Greenland site. It is also 4 to 8 times smaller than the deposition rates found in most sea sediments. Measurements of the complete Be-10 profile over the entire length of the core from which the present samples were taken (estimated to go back to 35,000 B.P.) are planned.
- 33-1616  
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Ice sheets, Ice creep, Fracturing, Seismic surveys.  
Experimental evidence has not supported the hypothesis that tectonic processes operating within glaciers and ice sheets are analogous to those in the Earth. However, evidence of the existence of discrete shear planes within the antarctic ice sheet (31-1071 or F-17742) and evidence described here relating to the Greenland ice sheet indicate that faulting takes place at depth in cold ice sheets. The evidence suggests reconsideration of the concept of correspondence between flow and rupture at depth in the Earth and in cold ice sheets, as suggested earlier. Direct investigations at depth in ice sheets are made with relative ease as compared to the nearly impossible task of direct measurements in the Earth's mantle.
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- 33-1621  
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- 33-1623  
Reasons for decision northern pipelines. National Energy Board, Canada, Ottawa, Ministère of Supply and Services Canada, 1977, 3 vols., Report also available in French. No microfiche available.  
Gas pipelines, Cold weather construction, Frozen ground mechanics, Permafrost distribution, Discontinuous permafrost, Economic development, Environmental impact, Human factors.  
The Canadian National Energy Board reports its decision on the applications of several companies to construct a gas pipeline through the Mackenzie Valley, east and south, to supply the eastern Canadian and U.S. markets. Details of the lengthy hearings are set forth in terms of identifying the many groups and individuals who gave evidence and testimony, close examination of each applicant's financial structure and technical capabilities, and thorough consideration of the social, economic, and environmental impacts which would follow construction of the pipeline.
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33-1625

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33-1627

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Salting, Water pollution, Meltwater, Runoff, Ion density (concentration).

33-1629

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Salting, Water pollution, Runoff, Stream flow.

33-1632

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Salting, Ion density (concentration), Runoff, Lake water, Stratification, Suspended sediments, Sedimentation.

33-1633

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DBR Building Science Seminar, Autumn 1972, National Research Council, Canada. Division of Building Research. Proceedings, Sep. 1976, No.2, c110 leaves.

Meetings, Buildings, Construction materials, Deformation, Settlement (structural), Joints (junctions), Temperature effects, Moisture factors, Loads (forces).

33-1634

Polar sub-programme.

Global Atmospheric Research Programme (GARP). WMO-ICSU Joint Organizing Committee, World Meteorological Organization. GARP publications series, Mar. 1978, No.19, 47p., In English with French, Russian, and Spanish summaries. Numerous refs.

Baker, D.J., Jr., ed. Research projects, Climatology, Sea ice, Models, Measuring instruments.

Processes in the polar regions present special problems to GARP. The Polar Sub-programme is an attempt to address these problems within the terms of reference of the First GARP Global Experiment (FGGE) and the Climate Dynamics Sub-programme. The objectives of the Polar Sub-programme are: 1. To identify and study processes of particular importance in the polar regions relating to the improvement of weather prediction from general circulation models (GARP first objective); 2. To develop a basis for understanding the role of ice in climate dynamics through (a) parameterization of sea ice dynamics and related atmospheric and oceanic processes in climate models, and (c) establishment of an appropriate information base for

studies of the role of sea ice and polar continental ice masses in climatic change (GARP second objective). These objectives will be met through a Polar Experiment (POLEX) designed to augment and contribute to the FGGE, and continuing studies before and after FGGE aimed at the second objective above.

33-1635

Arctic islands for oil exploration. Consulting engineer, Oct. 1978, 42(10), p.70, 72.

Artificial islands, Petroleum industry.

33-1636

Studies of concrete and reinforced concrete. [Ispovedaniia po betonu i zhelezobetonu].

Oatula, A.A., ed, Cheliabinsk. Politekhnikeskii institut. Sbornik nauchnykh trudov, 1974, Vol.249, Cheliabinsk, 1974, 229p., In Russian. For selected articles see 33-1637 through 33-1642. Refs. passim.

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Concretes, Reinforced concrete, Concrete freezing, Frost resistance, Concrete strength, Freeze thaw cycles, Winter concreting.

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Shumilin, F.G., et al, Cheliabinsk. Politekhnikeskii institut. Sbornik nauchnykh trudov, 1974, Vol.149, p.3-8, In Russian. 4 refs.

Platonov, B.I., Semeniak, G.S., Ozhegov, E.K.

Cements, Cement additives, Moisture content, Freeze thaw cycles, Concrete strength.

33-1638

Influence of freeze thaw cycles of heavy concrete on the moisture diffusion coefficient. [Ispovedaniia vliianiia tsiklicheskogo zamorazhivaniia i ottaivaniia tiazhego betona na koefitsient diffuzii vlazi].

Maliutin, V.S., et al, Cheliabinsk. Politekhnikeskii institut. Sbornik nauchnykh trudov, 1974, Vol.149, p.9-15, In Russian. 6 refs.

Shumilin, F.G.

Concretes, Concrete aggregates, Concrete freezing, Freeze thaw cycles, Concrete strength.

33-1639

Selecting the optimal curing system for concretes before freezing, in winter concreting. [Vybór optimal'noi vyderzhki betonov do zamorazhivaniia pri zimnem betonirovanii].

Semeniakov, G.S., et al, Cheliabinsk. Politekhnikeskii institut. Sbornik nauchnykh trudov, 1974, Vol.149, p.30-40.

Pekker, V.I., Platonov, B.I., Ozhegov, E.K.

Winter concreting, Concrete curing, Concrete admixtures, Concrete freezing, Concrete strength, Electric heating.

33-1640

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Winter concreting, Concrete structures, Concrete pavements, Concrete admixtures, Concrete strength.

33-1641

Influence of water saturation on frost resistance and the amount of ice in haydite. [Vliianie vodonasyshcheniia na l'distost' i morozostoiost' keramzita].

Serobabin, S.I., et al, Cheliabinsk. Politekhnikeskii institut. Sbornik nauchnykh trudov, 1974, Vol.149, p.46-50, In Russian. 2 refs.

Trofimov, B.I.A.

Concretes, Porosity, Moisture content, Frost resistance, Freeze thaw cycles, Concrete strength.

33-1642

Strength of hot concrete adhesion to reinforcement during intensive cooling to low subzero temperatures. [Sipenie stierzhnevov armatury s betonom pri intensivnom ostyvanii gorachego betona do nizkikh otrit-satel'nykh temperatur].

Pantelev, V.M., Cheliabinsk. Politekhnikeskii institut. Sbornik nauchnykh trudov, 1974, Vol.149, p.149-154, In Russian. 3 refs.

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33-1643

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33-1644

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Polygonal topography, Patterned ground, Ice veins, Ice wedges, Ice formation, Ground ice.

33-1645

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33-1646

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33-1647

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33-1649

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33-1650

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33-1651

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Non-biogenic fixed nitrogen in antarctic surface waters. Bauer, E., et al, Nature, Nov. 2, 1978, 276(5683), p.96-97, Refs. Includes Reply by B.C. Parker et al and Comments by S.Z. El-Sayed. Biggs, D.C. Ice sheets, Ice composition, Water chemistry. Bauer takes exception to Parker et al's (32-2944 or F-19915) suggestion that auroral activity is a possible source of the non-biogenic fixed nitrogen content of antarctic ice, considering it likely that a large fraction of the fixed N would be destroyed photochemically before reaching the ground. He suggests galactic cosmic ray ionization as a mechanism for explaining the fixed N in antarctic snow. Biggs, in turn, disputes Parker et al's claim that inorganic nitrogen-laden ice originating on the antarctic continent might provide a major contribution to the N budget for the epipelagic zone of the Southern Ocean. Biggs concludes that the input of non-biogenic NO<sub>3</sub>-N and NH<sub>4</sub>-N derived from continental ice is probably insignificant in the overall nitrogen budget for epipelagic antarctic seas, although enrichment from melting ice may be locally important. It is also likely that biogenic NH<sub>4</sub>-N from zooplankton and nekton excretion far outweighs NH<sub>4</sub>-N input from continental ice.
- Parker et al contend that Biggs' calculations were based on mean values, assuming uniform mixing to a depth of 50 m, and icebergs are not distributed uniformly through time and space, nor are their nitrogenous contents uniform. With respect to Bauer's comments, Parker et al question the photochemical destruction of NO under the given circumstances and reject the galactic cosmic ray model. El-Sayed apologizes for a misprint in his data on nutrient data, which was referenced by Parker et al in their calculations.
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33-1745

Creep of floating ice sheets, computer calculations. Garbaccio, D.H., *U.S. Naval Construction Battalion Center, Port Hueneme, Calif. Civil Engineering Laboratory. Contractor report*, Dec. 1968, NCEL-CR-69.014, 100p. AD-849 368.

Floating ice, Ice sheets, Ice creep, Mathematical models, Computer applications.

33-1746

Research of microwave scattering properties of snow fields.

Angelakos, D.J., *U.S. National Aeronautics and Space Administration. Contractor report*, Aug. 1978, NASA-CR-157472, 32p. N78-29303.

Microwaves, Backscattering, Snow optics, Snow water content.

33-1747

Viscoelastic-plastic constitutive model with a finite element solution methodology.

Katona, M., *U.S. Naval Construction Battalion Center, Port Hueneme, Calif. Civil Engineering Laboratory. Technical report*, June 1978, CEL-TR-866, 158p. ADA-057 684.

Viscoelasticity, Plastic properties, Mathematical models, Sea ice, Ice creep.

A textbook style development of viscoplasticity is presented. For completeness, the report also includes a detailed review of plasticity and viscoelasticity. The combination of plasticity and viscoelasticity is the basis for the so-called viscoelastic-plastic model developed herein. The viscoelastic-plastic model is compared to experimental data for plexiglas and sea ice to illustrate the versatility of the model in replicating nonlinear creep and flow of these materials. Moreover, the identification of the model parameters are shown to be no more difficult than the identification of parameters for the classical theories of plasticity and viscoelasticity.

33-1748

Investigation of ice clogged channels in the St. Marys River.

Mellor, M., et al, *U.S. Coast Guard. Report*, Mar. 1978, USCG-D-22-78, MP 1170, 73p. ADA-058 015.

Vance, G.P., Wuebben, J.L., Frankenstein, G.E. Ice breaking, Ice jams, Channels (waterways), Cost analysis.

This study addresses itself to the problem of removing brash ice from Frechette Point to Six-Mile Point of the Little Rapids Cut of the St. Marys River system. The area and river system are described and estimates are made for partially clearing a channel 250 ft wide. Rough costs, based on dollars per horsepower, indicate that it would cost between 1 and 2 million dollars per clear channel mile per year.

33-1749

Comprehensive studies of Arctic pack ice in April 1976.

Garrison, G.R., et al, *Washington (State). University. Applied Physics Laboratory. Report*, May 1978, APL-UW 7724, 93p. ADA-058 265.

Francois, R.E., Early, E.W., Wen, T. Pack ice, Ice cover thickness, Ice bottom surface, Ice surveys, Infrared photography, Lasers, Microwaves, Ice erosion, Surface roughness.

33-1750

Below-mud line well completion system lessens iceberg, anchor, trawl damage. *Ocean industry*, Nov. 1978, 13(11), p.64-65.

Oil wells, Offshore structures, Ocean bottom.

33-1751

Development of the Baykal Amur railroad zone under economic-geographical aspects. (Die Erschliessung der BAM-Zone unter ökonomisch-geographischen Aspekten).

Medvedkova, E.A., et al, *Petermanns geographische Mitteilungen*, 1978, 122(1), p.37-43, In German with English and Russian summaries. 12 refs.

Misevich, K.N. Taiga terrain, Land development, Economic development, Cold weather construction, Baykal Amur railroad, Economic analysis, Agriculture, Permafrost beneath structures.

33-1752

Environmental atlas of the Greater Anchorage Area Borough, Alaska.

Selkregg, L.L., ed, Anchorage, Alaska, Arctic Environmental Information and Data Center, University of Alaska, Dec. 1972, 105p., Refs. p.103-105. No microfiche available.

Arctic topography, Geologic structures, Hydrology, Arctic vegetation, Arctic climate, Land development, Waste disposal, Maps, Photographs, Human factors, Pollution, United States—Alaska—Anchorage.

- 33-1753**  
Winter testing of the Leopard Tank.  
Icken, T., *U.S. Army Foreign Science and Technology Center. Technical translation*, (1970), FSTC-HT-23-794-70, 20p., Translation from Jahrbuch der Wehrtechnik, 1968, No.3.  
Military equipment, Cold weather operation, Tanks (combat vehicles), Cold weather tests.
- 33-1754**  
Critical soil erosion by rapid runoff of heavy rain or snow water.  
Roshke, G., *U.S. Army Foreign Science and Technology Center. Technical translation*, (1970), FSTC-HT-23-1059-70, 13p., 11 refs. Translation from Wasser und Boden, Jan. 1970, No.1, p.6-10.  
Soil erosion, Countermeasures, Runoff, Snowmelt, Wind erosion, Water flow, Slope processes, Water pressure, Slope protection, Rain.
- 33-1755**  
Hydrometeorological literature review for the Delta-Clearwater Creek area.  
Fox, J.D., *Alaska. University. Institute of Water Resources. Report*, June 1978, IWR-92, 49p., Refs. p.47-49. Microfiche only.  
Hydrology, Meteorological data, Environments, Bibliographies, Arctic regions, Agriculture, Ground water, Water supply, United States—Alaska—Delta-Clearwater Creek.
- 33-1756**  
Alaska wastewater treatment technology; completion report.  
Johnson, R.A., *Alaska. University. Institute of Water Resources. Report*, Jan. 1978, IWR-86, 183p., Refs. p.154-163. Microfiche only.  
Waste treatment, Environmental impact, Pollution, Water treatment, United States—Alaska.
- 33-1757**  
Flood frequency design in sparse-data regions.  
Carlson, R.F., et al, *Alaska. University. Institute of Water Resources. Report*, June 1978, IWR-94, 11p., 6 refs. Microfiche only.  
Fox, P.M.  
Flood forecasting, Streams, Channels (waterways), Shore erosion, Icebound rivers, Hydrology, Design criteria, Arctic regions, Models, Pipelines.
- 33-1758**  
Historical survey of water utilization in the Cook Inlet-Susitna basin, Alaska.  
Hunt, W.R., *Alaska. University. Institute of Water Resources. Report*, June 1978, IWR-85, 4p., Microfiche only.  
Hydrology, Economic development, Water supply, History, Research projects, United States—Alaska—Cook Inlet, United States—Alaska—Susitna River.
- 33-1759**  
Effects of thermal discharge upon a subarctic stream.  
Carlson, R.F., et al, *Alaska. University. Institute of Water Resources. Report*, June 1978, IWR-49, 66p., 11 refs. Microfiche only.  
Tilsworth, T., Hok, C.  
Thermal pollution, Electric power plants, Thermal regime, River ice, Streams, Heat transfer, Environmental impact, Ice fog, Water temperature, Subarctic regions, United States—Alaska—Chena River.
- 33-1760**  
Comparison of theoretical and observed temperature profiles in Devon Island ice cap, Canada.  
Paterson, W.S.D., et al, *Geophysical journal*, Dec. 1978, 55(3), p.615-632, 19 refs.  
Clarke, G.K.C.  
Ice sheets, Ice models, Ice temperature, Temperature variations, Profiles, Heat transfer, Ice mechanics.
- 33-1761**  
Carbohydrate mobilization and movement in alpine plants.  
Wallace, L.L., et al, *American journal of botany*, Nov.-Dec. 1978, 65(10), p.1035-1040, 12 refs.  
Harrison, A.T.  
Alpine tundra, Alpine vegetation, Temperature effects, Plants (botany), Cold weather survival.
- 33-1762**  
On the heat and mass balance of the Arctic ice pack.  
Maykut, G.A., *U.S. Office of Naval Research. Naval research reviews*, July 1978, 31(7), p.17-35, 16 refs.  
Sea ice, Pack ice, Heat balance, Mass balance, Ice cover thickness, Ice models, Solar radiation.
- 33-1763**  
Support of structures in permafrost areas.  
Klohn, E.J., et al, *Engineering journal*, Oct. 1978, 61(4), p.28-32.  
Davison, D.M.  
Permafrost beneath structures, Permafrost preservation, Foundations, Pile foundations, Soil strength, Frost heave, Active layer.
- 33-1764**  
Evaluation of the engineering design parameters for glacial clays.  
Marland, A., *Engineering geology*, 1977, 10(1), p.1-26, 33 refs.  
Glacial till, Clay soils, Soil strength, Loads (forces).
- 33-1765**  
Engineering properties, groundwater conditions, and the nature of soil movement on a solifluction slope in north Norway.  
Harris, C., *Engineering geology*, 1977, 10(1), p.27-43, 16 refs.  
Ground thawing, Solifluction, Slope stability, Soil creep.
- 33-1766**  
Genetic influences on the properties of tills.  
McGown, A., et al, *Engineering geology*, 1977, 10(4), p.389-410, 40 refs.  
Derbyshire, E.  
Glacial till, Soil structure, Classifications, Engineering geology.
- 33-1767**  
Hydraulic model investigation of drifting snow.  
Wuebben, J.L., *U.S. Army Cold Regions Research and Engineering Laboratory*, June 1978, CR 78-16, 29p. ADA-059 175.  
Hydraulic structures, Snowdrifts, Models, Boundary value problems, Snow fences.  
A model investigation of drifting snow conditions was conducted in a hydraulic flume using a sand-water analog. Model results were evaluated to define modeling parameters that would allow quantitative correlation between measured prototype drift conditions and the model. Models of the fence were constructed for three heights and two geometric scales. Geometric scaling was based on terrain roughness and boundary layer thickness considerations, while velocity scaling was based on particle fall velocity and threshold of motion characteristics. Simulation of the atmospheric boundary layer was found to be of primary importance. Velocity scaling analysis suggested the use of a 'significant wind' concept, based on a combination of velocity magnitude and frequency. Similarity of precipitation rate was not essential, and could be altered within limits to adjust the time scale.
- 33-1768**  
Guide to the use of 14N and 15N in environmental research.  
Edwards, A.P., *U.S. Army Cold Regions Research and Engineering Laboratory*, Sep. 1978, SR 78-18, 77p. ADA-060 385.  
Wastes, Water chemistry, Isotopic labeling, Research projects.  
The fate of the mineral nitrogen in wastewater can be established only through natural or artificial stable isotopic labeling. This report assesses the possibilities and problems associated with such tracer techniques applied to the small amounts of nitrogen normally present after secondary waste treatment. The methods outlined for sample processing to minimize analytical errors are applicable to other types of environmental research involving isotope ratio analysis as a means of tracing nitrogen in the biosphere.
- 33-1769**  
Precasting speeds snowshed erection.  
Koehl, S., *Construction west*, Dec. 1978, Edition E, Vol.1, p.43, 45.  
Prefabrication, Prestressed concrete, Avalanche engineering.
- 33-1770**  
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Neshyba, S., *Nature*, Oct. 12, 1978, 275(5680), p.567, 6 refs.  
Icebergs, Ice melting, Meltwater, Sea water, Convection.  
It is postulated that Huppert and Turner's laboratory studies (33-1453 or F-20907) of ice melt in warm, salt-stratified water, which demonstrate a system of tilted convection layers of melt mixture interleaved with ambient fluid, are useful in focusing research upon the complex phenomenon of iceberg melt but can not be extrapolated so directly to *in situ* antarctic iceberg melting as the authors have done, for several reasons. The reasons are enumerated.
- 33-1771**  
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Nauchnyi seminar: Metodika inzhenerno-geologicheskikh issledovaniĭ i kartirovaniia oblasti vechnoi merzloty, Yakutsk, 1977, Yakutskoe knizhnoe izdatel'stvo, 1977, 74p., In Russian. For selected papers see 33-1772 through 33-1784.  
Permafrost forecasting, Maps, Geological surveys, Geophysical surveys, Measuring instruments, Mapping, Permafrost distribution, Permafrost transformation, Permafrost structure, Permafrost depth, Drilling, Submarine permafrost, Permafrost thermal properties, Stefan problem.
- 33-1772**  
Using electrical exploration methods in solving geocryological problems on northern sea shelves. (Primenenie elektrorazvedochnykh rabot dlia resheniia geokriologicheskikh zadach na shel'fakh severnykh moreĭ).  
Kholmianskiĭ, M.A., et al, Nauchnyi seminar: Metodika inzhenerno-geologicheskikh issledovaniĭ i kartirovaniia oblasti vechnoi merzloty, Yakutsk, Tezisy dokladov. Vyp.2 (Seminar on methods of engineering-geological investigations and mapping in permafrost areas, Yakutsk, 1977. Abstracts of papers. Vol.2), Yakutskoe knizhnoe izdatel'stvo, 1977, p.6-7, In Russian.  
Neizvestnov, I.A.V.  
Shores, Submarine permafrost, Electrical prospecting, Permafrost distribution, Permafrost depth, Permafrost structure, Arctic Ocean.
- 33-1773**  
Geophysical methods used in combination with geocryological and engineering-geological investigations in mining exploration. (Geofizicheskie metody v komplekse merzlotno-inzhenerno-geologicheskikh issledovaniĭ pri razvedke mestorozhdeniĭ).  
Demidiuk, L.M., et al, Nauchnyi seminar: Metodika inzhenerno-geologicheskikh issledovaniĭ i kartirovaniia oblasti vechnoi merzloty, Yakutsk, 1977. Tezisy dokladov. Vyp.2 (Seminar on methods of engineering-geological investigations and mapping in permafrost areas, Yakutsk, 1977. Abstracts of papers. Vol.2), Yakutskoe knizhnoe izdatel'stvo, 1977, p.7-9, In Russian.  
Kovalko, V.V., Shaumian, L.V.  
Permafrost distribution, Geological surveys, Geophysical surveys, Permafrost structure, Permafrost thickness, Permafrost depth.
- 33-1774**  
Radar sounding of naleds. (Radiolokatsionnoe zondirovanie naledĭ).  
Glushnev, V.G., et al, Nauchnyi seminar: Metodika inzhenerno-geologicheskikh issledovaniĭ i kartirovaniia oblasti vechnoi merzloty, Yakutsk, 1977. Tezisy dokladov. Vyp.2 (Seminar on methods of engineering-geological investigations and mapping in permafrost areas, Yakutsk, 1977. Abstracts of papers. Vol.2), Yakutskoe knizhnoe izdatel'stvo, 1977, p.13-14, In Russian.  
Chizhov, A.N.  
Naleds, Geophysical surveys, Radar echoes, Ice physics, Electrical properties.
- 33-1775**  
Possibilities of the induced polarization technique in permafrost investigations. (Rasshirenie vozmozhnostei metoda vyzvannoi polarizatsii pri izuchenii merzlykh porod).  
Butakov, L.I., Nauchnyi seminar: Metodika inzhenerno-geologicheskikh issledovaniĭ i kartirovaniia oblasti vechnoi merzloty, Yakutsk, 1977. Tezisy dokladov. Vyp.2 (Seminar on methods of engineering-geological investigations and mapping in permafrost areas, Yakutsk, 1977. Abstracts of papers. Vol.2), Yakutskoe knizhnoe izdatel'stvo, 1977, p.17-18, In Russian.  
Permafrost distribution, Ground ice, Permafrost structure, Geophysical surveys, Electrical prospecting, Measuring instruments.

33-1776

New method of accelerated electrical profiling developed for engineering and geocryological surveys. (Novyy metod uskorennoy elektropofilirovaniia dlia tselei inzhenerno-geokriologicheskoi s'emki, Timofeev, V.M., Nauchnyy seminar: Metodika inzhenerno-geologicheskikh issledovaniy i kartirovaniia oblasti vechnoi merzloty, Yakutsk, 1977. Tezisy dokladov. Vyp.2 (Seminar on methods of engineering-geological investigations and mapping in permafrost areas, Yakutsk, 1977. Abstracts of papers. Vol.2), Yakutskoe knizhnoe izdatel'stvo, 1977, p.19-20, In Russian.

Permafrost distribution, Engineering geology, Geophysical surveys, Electrical prospecting, Measuring instruments.

33-1777

Electric profiling techniques and data interpretation in engineering-geocryological surveys of northern West Siberia. (Nekotorye voprosy metodiki provedeniia i interpretatsii elektropofilirovaniia pri inzhenerno-geokriologicheskoi s'emke na severe Zapadnoi Sibiri, Timofeev, V.M., et al, Nauchnyy seminar: Metodika inzhenerno-geologicheskikh issledovaniy i kartirovaniia oblasti vechnoi merzloty, Yakutsk, 1977. Tezisy dokladov. Vyp.2 (Seminar on methods of engineering-geological investigations and mapping in permafrost areas, Yakutsk, 1977. Abstracts of papers. Vol.2), Yakutskoe knizhnoe izdatel'stvo, 1977, p.23-24, In Russian.

Pugach, V.B.

Electrical prospecting, Engineering geology, Permafrost structure, Ground ice, Permafrost forecasting, Data processing.

33-1778

Peculiarities of well logging under permafrost conditions. (Osobennosti karotazha skvazhin v usloviakh mnogoletnei merzloty, Musin, A.M., et al, Nauchnyy seminar: Metodika inzhenerno-geologicheskikh issledovaniy i kartirovaniia oblasti vechnoi merzloty, Yakutsk, 1977. Tezisy dokladov. Vyp.2 (Seminar on methods of engineering-geological investigations and mapping in permafrost areas, Yakutsk, 1977. Abstracts of papers. Vol.2), Yakutskoe knizhnoe izdatel'stvo, 1977, p.30-32, In Russian.

Sedov, B.M.

Permafrost physics, Electrical prospecting, Drilling, Well logging.

33-1779

Using the independent net method in solving one-dimensional Stefan problems. (Reshenie odnomernoi zadachi Stefana metodom nezavisimoi setki, Smorygin, G.I., et al, Nauchnyy seminar: Metodika inzhenerno-geologicheskikh issledovaniy i kartirovaniia oblasti vechnoi merzloty, Yakutsk, 1977. Tezisy dokladov. Vyp.2 (Seminar on methods of engineering-geological investigations and mapping in permafrost areas, Yakutsk, 1977. Abstracts of papers. Vol.2), Yakutskoe knizhnoe izdatel'stvo, 1977, p.38-40, In Russian.

Fandeev, V.V.

Stefan problem, Artificial thawing, Heat transfer, Permafrost.

33-1780

Using the thermoelasticity theory in solving engineering and geocryology problems. (O primeneni teorii termoprugosti v zadachakh inzhenernoi geokriologii, Kronik, I.A., Nauchnyy seminar: Metodika inzhenerno-geologicheskikh issledovaniy i kartirovaniia oblasti vechnoi merzloty, Yakutsk, 1977. Tezisy dokladov. Vyp.2 (Seminar on methods of engineering-geological investigations and mapping in permafrost areas, Yakutsk, 1977. Abstracts of papers. Vol.2), Yakutskoe knizhnoe izdatel'stvo, 1977, p.42-44, In Russian.

Permafrost thermal properties, Elastic properties, Rheology, Analysis (mathematics).

33-1781

Solving problems on freezing (thawing) of fine-grained ground. (Sposob reshenia zadachi na promerzanie (otaitvanie) tonkodispersnogo grunta, Kononov, A.A., Nauchnyy seminar: Metodika inzhenerno-geologicheskikh issledovaniy i kartirovaniia oblasti vechnoi merzloty, Yakutsk, 1977. Tezisy dokladov. Vyp.2 (Seminar on methods of engineering-geological investigations and mapping in permafrost areas, Yakutsk, 1977. Abstracts of papers. Vol.2), Yakutskoe knizhnoe izdatel'stvo, 1977, p.45-46, In Russian.

Soil freezing, Thermal conductivity, Frost penetration, Analysis (mathematics).

33-1782

Mathematical model of ground freeze-thaw beneath plastic covers. (Matematicheskai model' protessa otaitvaniia-promerzaniia grunta pod plenochnymi pokrytiiami, Smorygin, G.I., et al, Nauchnyy seminar: Metodika inzhenerno-geologicheskikh issledovaniy i kartirovaniia oblasti vechnoi merzloty, Yakutsk, 1977. Tezisy dokladov. Vyp.2 (Seminar on methods of engineering-geological investigations and mapping in permafrost areas, Yakutsk, 1977. Abstracts of papers. Vol.2), Yakutskoe knizhnoe izdatel'stvo, 1977, p.52-53, In Russian.

Vediev, I.U.M.

Permafrost thermal properties, Mathematical models, Frost penetration, Heat transfer, Plastics, Covering, Artificial thawing.

33-1783

Present state of geocryological forecasting. (Sovremennoe sostoianie geokriologicheskoi prognostiki, Kudriavtsev, V.A., et al, Nauchnyy seminar: Metodika inzhenerno-geologicheskikh issledovaniy i kartirovaniia oblasti vechnoi merzloty, Yakutsk, 1977. Tezisy dokladov. Vyp.2 (Seminar on methods of engineering-geological investigations and mapping in permafrost areas, Yakutsk, 1977. Abstracts of papers. Vol.2), Yakutskoe knizhnoe izdatel'stvo, 1977, p.56-57, In Russian.

Permafrost forecasting, Theories.

33-1784

Types of engineering-geocryological forecasts. (Vidy inzhenerno-geokriologicheskogo prognoza, Maksimova, L.N., Nauchnyy seminar: Metodika inzhenerno-geologicheskikh issledovaniy i kartirovaniia oblasti vechnoi merzloty, Yakutsk, 1977. Tezisy dokladov. Vyp.2 (Seminar on methods of engineering-geological investigations and mapping in permafrost areas, Yakutsk, 1977. Abstracts of papers. Vol.2), Yakutskoe knizhnoe izdatel'stvo, 1977, p.57-60, In Russian.

Permafrost forecasting, Permafrost transformation, Permafrost depth, Classifications.

33-1785

Use of infrared and visible imagery for sea ice monitoring. (McClain, E.P., Washington, D.C., National Environmental Satellite Service, 17p. + 14 figs., 35 refs. Unpublished manuscript. Background material for WMO Workshop on Remote Sensing of Sea Ice, Washington, D.C., Oct. 16-20, 1978.

Sea ice distribution, Pack ice, Ice forecasting, Infrared photography, Remote sensing, Infrared mapping, Photometers, Climatic factors, Aerial reconnaissance.

This is a supplement to and an updating of "Earth satellite measurements as applied to sea ice problems" (see 29-3205 or F-14829). Emphasis is given to the mapping of pack ice conditions and to the climatic effects of ice in the Arctic and Antarctic. The use of visible and infrared scanners carried on aircraft and spacecraft is described, and special processing of satellite data is discussed. The U.S. Navy has prepared weekly operational ice analysis and forecasts for the Arctic and Antarctic since 1970. Data were assembled into atlas form and published for the Arctic since 1972, and for the Antarctic since 1973. NOAA satellite data are used also for climate or climate-related investigations, i.e., to study sea ice variations in relation to climate, finding correlations between variations of annual mean temperature and the duration and extent of sea ice.

33-1786

Alaska's engineering heritage. American Society of Civil Engineers. Alaska Section, (1976), 140p., 43 refs.

Civil engineering, Construction, Structures, Roads, Railroads, Transportation, Telecommunication, History, United States—Alaska.

33-1787

Soil disturbance from pile driving in sensitive clay. Bozozuk, M., et al, Canadian geotechnical journal, Aug. 1978, 15(3), p.346-361, 11 refs.

Fellenius, B.H., Samson, L.

Clay soils, Pile driving, Settlement (structural), Soil dynamics, Bearing capacity, Concrete slabs, Marine geology.

33-1788

Seminar on methods of engineering-geological investigations and mapping of permafrost regions, Yakutsk, 1977. Abstracts of papers. Vol.3. (Tezisy dokladov. Vyp.3, Nauchnyy seminar: Metod'ka inzhenerno-geologicheskikh issledovaniy i kartirovaniia oblasti vechnoi merzloty, Yakutsk, 1977, Yakutskoe knizhnoe izdatel'stvo, 1977, 127p., In Russian. For individual papers see 33-1789 through 33-1813.

Permafrost thermal properties, Frost heave, Unfrozen water content, Ground ice, Ice formation, Active layer, Cryogenic soils, Soil compacting, Roads, Embankments, Permafrost beneath structures, Permafrost bases, Slope processes, Slope stability, Solifluction, Earth dams, Pipelines.

33-1789

Allowing for the strength of adfreezing when forecasting the stability of frozen slopes and tailings. (Uchet prochnosti smerzaniia pri prognozirovani ustoi-chivosti merzlykh otvalov i sklonov, Bondarenko, G.I., Nauchnyy seminar: Metodika inzhenerno-geologicheskikh issledovaniy i kartirovaniia oblasti vechnoi merzloty, Yakutsk, 1977. Tezisy dokladov. Vyp.3 (Seminar on methods of engineering-geological investigations and mapping in permafrost areas, Yakutsk, 1977. Abstracts of papers. Vol.3), Yakutskoe knizhnoe izdatel'stvo, 1977, p.12-13, In Russian.

Slope processes, Slope stability, Embankments, Freeze thaw cycles, Analysis (mathematics).

33-1790

Geocryological studies for planning gas-line construction in West Siberia. (Geokriologicheskie issledovaniia dlia obosnovaniia stroitel'stva gazoprovodov v Zapadnoi Sibiri, Dubikov, G.I., et al, Nauchnyy seminar: Metodika inzhenerno-geologicheskikh issledovaniy i kartirovaniia oblasti vechnoi merzloty, Yakutsk, 1977. Tezisy dokladov. Vyp.3 (Seminar on methods of engineering-geological investigations and mapping in permafrost areas, Yakutsk, 1977. Abstracts of papers. Vol.3), Yakutskoe knizhnoe izdatel'stvo, 1977, p.18-20, In Russian.

Belopukhova, E.B., Danilova, N.S., Stremiakov, A.I.A.

Pipelines, Permafrost beneath structures, Surveys, Design.

33-1791

Studying engineering-geological processes related to the construction and operation of main pipelines. (Osnovnye problemy issledovaniia nekotorykh inzhenerno-geologicheskikh protsessov v sviazi so stroitel'stvom i ekspluatatsiei magistral'nykh truboprovodov, Garagulia, L.S., et al, Nauchnyy seminar: Metodika inzhenerno-geologicheskikh issledovaniy i kartirovaniia oblasti vechnoi merzloty, Yakutsk, 1977. Tezisy dokladov. Vyp.3 (Seminar on methods of engineering-geological investigations and mapping in permafrost areas, Yakutsk, 1977. Abstracts of papers. Vol.3), Yakutskoe knizhnoe izdatel'stvo, 1977, p.21-22, In Russian.

Parmuzin, S.I.U.

Pipelines, Permafrost beneath structures, Design, Cold weather operation.

33-1792

Geocryological-engineering-geological surveying of an underground section of an operating gas-pipeline. (Opyt merzlotno-inzhenerno-geologicheskikh issledovani na podzemnom uchastke odnogo iz deistvuiushchikh severnykh gazoprovodov, Kondrat'ev, V.G., et al, Nauchnyy seminar: Metodika inzhenerno-geologicheskikh issledovaniy i kartirovaniia oblasti vechnoi merzloty, Yakutsk, 1977. Tezisy dokladov. Vyp.3 (Seminar on methods of engineering-geological investigations and mapping in permafrost areas, Yakutsk, 1977. Abstracts of papers. Vol.3), Yakutskoe knizhnoe izdatel'stvo, 1977, p.24-25, In Russian.

Subsurface structures, Pipelines, Permafrost beneath structures.

33-1793

Basic engineering-geocryological problems of power engineering in permafrost areas. (Nekotorye osnovnye inzhenerno-geokriologicheskie problemy v praktike energeticheskogo stroitel'stva v oblasti vechnoy merzloty). Tsytovich, N.A., et al, Nauchnyy seminar: Metodika inzhenerno-geologicheskikh issledovaniy i kartirovaniya oblasti vechnoy merzloty, Yakutsk, 1977. Tezisy dokladov. Vyp.3 (Seminar on methods of engineering-geological investigations and mapping in permafrost areas, Yakutsk, 1977. Abstracts of papers. Vol.3), Yakutskoe knizhnoe izdatel'stvo, 1977, p.33-35, In Russian.  
Kronik, I.A.A.  
Hydroelectric power generation, Hydraulic structures, Earth dams, Frost penetration, Permafrost beneath structures.

33-1794

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33-1815

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33-1819

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33-1821

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33-1825

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33-1832

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33-1833

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33-1834

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Winter concreting, Concrete freezing, Concrete hardening, Concrete admixtures, Antifreezes, Concrete strength, Concrete placing.

33-1835

Winter concreting at the sites of the Bratsk and Ust'-Ilimsk hydroelectric power plants. (Zimnee betonirovanie na Bratskoi i Ust'-Ilimskoi GES). Alekseev, K.V., et al, International Symposium on Winter Concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.1, Moscow, Stroizdat, 1975, p.183-191. In Russian. English summary p.358. 7 refs. Gershanovich, G.L., Sadovich, M.A. DLC TA682.43.157  
Winter concreting, Concrete freezing, Concrete hardening, Hydraulic structures, Concrete placing.

33-1836

Theory and technology of concreting with electrically heated concrete mix. (Teoriia i tekhnologiia betonirovaniia s elektrorozgrevom smesi). Arben'ev, A.S., International Symposium on Winter Concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.1, Moscow, Stroizdat, 1975, p.191-199. In Russian. English summary p.360. 6 refs. DLC TA682.43.157  
Winter concreting, Concrete hardening, Concrete heating, Concrete placing.

33-1837

Electric pads for heating concrete in freezing weather. (Primenenie termoelektricheskikh matov dlia obogreva betona v zimnikh usloviakh). Akhanov, V.S., International Symposium on Winter Concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.1, Moscow, Stroizdat, 1975, p.199-207. In Russian. English summary p.360. 5 refs. DLC TA682.43.157  
Winter concreting, Concrete heating, Electric heating, Concrete hardening.

33-1838

Winter concreting techniques used in the Tagilstroil Trust, Central Ural Mountains. (Praktika zimnego betonirovaniia na Srednem Urale (na opyte ordena Lenina tresta Tagilstroil)). Biziaev, A.I., International Symposium on Winter Concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.1, Moscow, Stroizdat, 1975, p.207-215. DLC TA682.43.157  
Foundations, Concrete placing, Concrete freezing, Concrete heating, Concrete hardening, Concrete admixtures, Winter concreting.

33-1839

Erection of multistory solid concrete and masonry buildings in freezing weather without heating. (Stroitel'stvo mnogoetazhnykh monolitnobetonnykh i kamennykh zdaniy v zimnikh usloviakh besprognyym metodom). Bravinskii, E.A., et al, International Symposium on Winter Concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.1, Moscow, Stroizdat, 1975, p.216-227. In Russian. English summary p.362. Tokamkova, I.A., Ovcharov, V.I., Tsiron, M.F. DLC TA682.43.157  
Buildings, Winter concreting, Concrete strength, Concrete structures, Foundations, Concrete placing.

33-1840

Winter concreting with the use of electrically conductive coatings. (Zimnee betonirovanie s primeneniem tokoprovodiashchikh pokrytiy). Gendin, V.I.A., et al, International Symposium on Winter Concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.1, Moscow, Stroizdat, 1975, p.227-235. In Russian. English summary p.364. Shevchenko, I.U.K., Abramov, V.S., Pokatilov, V.P. DLC TA682.43.157  
Winter concreting, Concrete heating, Electric heating, Coatings, Resins, Formwork (construction).

33-1841

Methods of placing concrete when building cast-in-situ structures of power plants at subzero temperature. (Metody betonirovaniia massivnykh monolitnykh konstruktсий pri otritsatel'noi temperature na ob'ektakh teploenergeticheskogo stroitel'stva). Generalov, B.V., et al, International Symposium on Winter Concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.1, Moscow, Stroizdat, 1975, p.235-244. In Russian. English summary p.364. 1 ref. Karimov, A.Z. DLC TA682.43.157  
Foundations, Winter concreting, Concrete structures, Buildings, Concrete placing.

33-1842

Technological and economic analysis of winter concreting techniques. (Tekhniko-ekonomicheskii analiz metodov zimnego betonirovaniia). Golovnev, S.G., International Symposium on Winter Concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.1, Moscow, Stroizdat, 1975, p.245-254. In Russian. English summary p.366. 2 refs. DLC TA682.43.157  
Winter concreting, Economic analysis, Construction costs.

33-1843

Investigation of a combined concrete curing technique. (Issledovanie kompleksnogo metoda vyderzhivaniia betona). Zamoshchik, A.I., et al, International Symposium on Winter Concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.1, Moscow, Stroizdat, 1975, p.254-262. In Russian. English summary p.366. 3 refs. Lazarev, A.D. DLC TA682.43.157  
Winter concreting, Concrete heating, Concrete curing, Concrete hardening, Concrete strength.

33-1844

Selecting optimum time for starting heating of concrete in winter placing. (O vybere optimal'nogo vremeni prilozheniia teplovogo vozdeistviia pri zimnem betonirovaniia). Zasedatelev, I.B., et al, International Symposium on Winter Concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.1, Moscow, Stroizdat, 1975, p.262-274. In Russian. English summary p.368. 25 refs. Mishin, G.V., Shifrin, S.A. DLC TA682.43.157  
Winter concreting, Concrete curing, Concrete heating, Concrete hardening, Concrete strength.

33-1845

Improving practical methods of winter concreting with antifreeze admixtures and thermal treatment. (Sovershenstvovanie prakticheskikh metodov zimnego betonirovaniia s primeneniem protivomoroznykh dobavok i progressivnykh sposobov teplovoi obrabotki). Isaev, V.S., et al, International Symposium on Winter Concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.1, Moscow, Stroizdat, 1975, p.274-283. In Russian. English summary p.368. 6 refs. DLC TA682.43.157  
Winter concreting, Concrete admixtures, Antifreezes, Concrete heating.

33-1846

No-heating method of concrete placing and grouting in bridge construction. (Bezobogreivnoe betonirovanie i omonolichivanie mostovykh konstruktсий). Kostiaev, P.S., et al, International Symposium on Winter Concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.1, Moscow, Stroizdat, 1975, p.283-293. In Russian. English summary p.370. DLC TA682.43.157  
Bridges, Grouting, Winter concreting, Concrete structures, Concrete placing.

33-1847

Improving crack resistance of massive winter-placed concrete. (Povyshenie treschinosil'nosti massivnykh konstruktсий pri zimnem betonirovaniia). Krylov, B.A., et al, International Symposium on Winter Concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.1, Moscow, Stroizdat, 1975, p.294-299. In Russian. English summary p.370. 3 refs. DLC TA682.43.157  
Winter concreting, Concrete freezing, Fracturing, Concrete curing, Concrete placing.

33-1848

Concrete strength control in winter concreting. (Kontrol' prochnosti betona pri zimnem betonirovaniia). Leshchinskii, M.I.U., International Symposium on Winter Concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.1, Moscow, Stroizdat, 1975, p.299-306. In Russian. English summary p.372. 7 refs. DLC TA682.43.157  
Winter concreting, Concrete hardening, Reinforced concrete, Concrete strength.

33-1849

Manufacturing prestressed structural elements in open air at low subzero temperatures. (Sposob izgotovleniia prednapriazhennykh konstruktсий na otkrytykh poligonakh pri nizkikh otritsatel'nykh temperaturakh). Markarov, N.A., et al, International Symposium on Winter Concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.1, Moscow, Stroizdat, 1975, p.306-312. In Russian. English summary p.372. Barmin, N.N. DLC TA682.43.157  
Winter concreting, Prefabrication, Prestressed concrete, Concrete strength, Frost resistance.

- 33-1850**  
Electric heating of mortars when grouting prestressed structures in freezing weather. (Elektroprogrez rastvora pri zimnem i'etsirovanii prednapriazhennykh konstruktst), Matkov, N.G., International Symposium on Winter Concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.1, Moscow, Stroiizdat, 1975, p.312-322, In Russian. English summary p.374. DLC TA682.43.I57  
Cold weather construction, Prestressed concrete, Grouting, Reinforced concrete.
- 33-1851**  
Winter concreting techniques for severe climatic conditions of the Vilyuy and Ust'-Khatanka hydroelectric power plants. (Tekhnologiya zimnego betonirovaniia v surovyykh klimaticheskikh usloviyakh (na stroitel'stve Viliuskoj i Ust'-Khatankskoj GES)), Matiushin, V.M., et al, International Symposium on Winter Concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.1, Moscow, Stroiizdat, 1975, p.322-329, In Russian. English summary p.374. DLC TA682.43.I57  
Hydraulic structures, Concrete structures, Dams, Winter concreting.
- 33-1852**  
Proceedings.  
Symposium on the Physics and Chemistry of Ice, Cambridge, England, Sep. 1977, *Journal of glaciology*, 1978, 21(85), 714p. For individual papers see 33-1853 through 33-1903. General discussion and abstracts of papers not published in full, p.669-708.  
Glen, J.W., ed, Adie, R.J., ed, Johnson, D.M., ed, Homer, D.R., ed, MacQueen, A.D., ed.  
Meetings, Ice physics, Ice composition.
- 33-1853**  
Distortion of a water molecule in ice.  
Whalley, E., *Journal of glaciology*, 1978, 21(85), p.13-31, In English with French and German summaries. Numerous refs.  
Molecular structure, Drops (liquids), Ice formation, Ice electrical properties.
- 33-1854**  
Clathrate ices—recent results.  
Davidson, D.W., et al, *Journal of glaciology*, 1978, 21(85), p.33-49, In English with French and German summaries. 35 refs.  
Ripmeester, J.A.  
Hydrates, Gas inclusions, Water chemistry, Nuclear magnetic resonance, Ice composition.
- 33-1855**  
X-ray determination of the structure of Ice IV.  
Engelhardt, H., et al, *Journal of glaciology*, 1978, 21(85), p.51-53, 4 refs. In English with French and German summaries.  
Kamb, B.  
Ice structure, X ray analysis, High pressure ice.
- 33-1856**  
Origin of the high-frequency translational bands of Ice I.  
Klug, D.D., et al, *Journal of glaciology*, 1978, 21(85), p.55-63, In English with French and German summaries. 25 refs.  
Whalley, E.  
Ice structure, Ice spectroscopy, Cubic ice.
- 33-1857**  
Translational lattice-vibration Raman spectrum of single-crystal ice Ih.  
Faure, P., et al, *Journal of glaciology*, 1978, 21(85), p.65-72, In English with French and German summaries. 20 refs.  
Chosson, A.  
Ice crystal structure.
- 33-1858**  
Configurational statistics.  
Nagle, J.F., *Journal of glaciology*, 1978, 21(85), p.73-83, In English with French and German summaries. 40 refs.  
Ice crystal structure, Ice optics, High pressure ice, Ice dielectrics, Dielectric properties, Statistical data, Analysis (mathematics).
- 33-1859**  
Vacancies in pure ice studied by positron annihilation techniques.  
Mogensen, O.E., et al, *Journal of glaciology*, 1978, 21(85), p.85-99, In English with French and German summaries. 27 refs.  
Eldrup, M.  
Ice crystal structure, Ice composition, Particles, Temperature effects.
- 33-1860**  
Vacancies in HF-doped and in irradiated ice by positron annihilation techniques.  
Eldrup, M., et al, *Journal of glaciology*, 1978, 21(85), p.101-113, In English with French and German summaries. 33 refs.  
Mogensen, O.E., Bilgram, J.H.  
Ice deformation, Impurities, Gamma irradiation, Ice structure, Doped ice.
- 33-1861**  
Interaction of point defects in ice.  
Bilgram, J.H., et al, *Journal of glaciology*, 1978, 21(85), p.115-122, In English with French and German summaries. 9 refs.  
Gränicher, H.  
Ice crystal structure, Ice deformation, Impurities, Ice dielectrics, Temperature effects.
- 33-1862**  
Theoretical models for interpreting the dielectric behaviour of HF-doped ice.  
Campin, G.C., et al, *Journal of glaciology*, 1978, 21(85), p.123-141, In English with French and German summaries. 21 refs.  
Glen, J.W., Paren, J.G.  
Ice dielectrics, Impurities, Ice composition, Models, Doped ice.
- 33-1863**  
Electrical conductivity and relaxation in ice crystals with known impurity content.  
Gross, G.W., et al, *Journal of glaciology*, 1978, 21(85), p.143-160, In English with French and German summaries. 35 refs.  
Hayslip, I.C., Hoy, R.N.  
Ice electrical properties, Electrical resistivity, Ice composition, Impurities, Ice relaxation, Doped ice.
- 33-1864**  
Effect of pressure on the dielectric properties of ice Ih single crystals doped with NH<sub>3</sub> and HF.  
Hubmann, M., *Journal of glaciology*, 1978, 21(85), p.161-172, In English with French and German summaries. 23 refs.  
Ice crystal structure, Impurities, Ice dielectrics, Ice composition, Doped ice.
- 33-1865**  
Electrical behaviour of finely divided ice.  
Paren, J.G., et al, *Journal of glaciology*, 1978, 21(85), p.173-191, In English with French and German summaries. 25 refs.  
Glen, J.W.  
Ice structure, Ice dielectrics, Ice relaxation, Gas inclusions.  
The electrical behavior of ice which has been finely ground and compressed was investigated during aging in air and over a range of temperatures. The dielectric behavior may be accurately represented as the sum of two elliptical relaxation spectra. The behavior eventually stabilizes with similar activation energies for the mean relaxation time of each spectrum c. 0.25 eV, and the ratio of the relaxation times is ten in samples of density c. 0.42 Mg/cu m. Arguments are presented on whether the higher-frequency dispersion is a consequence of the heterogeneous nature of the samples or is a bulk relaxation process. The similarities between the behavior of such finely ground ice and of deposited snow and polar glacier ice are discussed. The extent to which the results may be attributed to surface adsorption of CO<sub>2</sub> are examined by reference to measurements of the CO<sub>2</sub> content of finely divided ice and ice from polar regions. (Auth.)
- 33-1866**  
Electrical properties of ice surfaces.  
Maeno, N., et al, *Journal of glaciology*, 1978, 21(85), p.193-205, In English with French and German summaries. 16 refs.  
Nishimura, H.  
Ice electrical properties, Ice resistivity, Ice temperature.
- 33-1867**  
Dielectric properties of dislocation-free ice.  
Itagaki, K., *Journal of glaciology*, 1978, 21(85), p.207-217, In English with French and German summaries. 20 refs.  
Ice crystals, Hoarfrost, Dislocations (materials), Ice dielectrics.  
Dielectric properties of dislocation-free hoarfrost ice crystals were measured in the audio-frequency range. Anomalous small relaxation strength was found in the dislocation-free area of the crystal samples, while dislocations deliberately introduced by scratching the samples drastically modified the relaxation strength. Since measurements made in the area of high dislocation density indicated normal behavior, electrically charged dislocations are considered to be the source of the normally observed dielectric relaxation.
- 33-1868**  
Measurements of the electrical properties of ice Ih single crystals by admittance and thermally stimulated depolarization techniques.  
Loria, A., et al, *Journal of glaciology*, 1978, 21(85), p.219-230, In English with French and German summaries. 21 refs.  
Mazzega, E., Del Pennino, U., Andreotti, G.  
Ice crystal structure, Ice electrical properties, Ice relaxation, Thermal effects, Ice spectroscopy.
- 33-1869**  
Inelastic neutron scattering from ice and other proton-containing substances.  
Dorner, B., *Journal of glaciology*, 1978, 21(85), p.231-240, In English with French and German summaries. 23 refs.  
Ice structure, Neutron scattering, Protons, Phase transformations.
- 33-1870**  
Thermal conductivity of ice in the temperature range 0.5 to 5.0K.  
Varrot, M., et al, *Journal of glaciology*, 1978, 21(85), p.241-245, In English with French and German summaries. 3 refs.  
Rochas, G., Klinger, J.  
Ice resistivity, Thermal conductivity, Low temperature research.
- 33-1871**  
Radiation damage in ice at low temperatures studied by proton channelling.  
Golecki, I., et al, *Journal of glaciology*, 1978, 21(85), p.247-258, In English with French and German summaries. 25 refs.  
Jaccard, C.  
Ice structure, Radiation, Protons, Backscattering.
- 33-1872**  
Orientation polarization in hexagonal ice parallel and perpendicular to the c-axis.  
Johari, G.P., et al, *Journal of glaciology*, 1978, 21(85), p.259-276, In English with French and German summaries. 39 refs.  
Jones, S.J.  
Ice crystal structure, Polarization (charge separation), Crystal orientation, Ice electrical properties.
- 33-1873**  
Influence of the rate of deformation on the electric properties of ice monocrystals.  
Noll, G., *Journal of glaciology*, 1978, 21(85), p.277-289, In English with French and German summaries. 20 refs.  
Ice electrical properties, Ice deformation, Ice crystal structure, Plastic deformation.
- 33-1874**  
CO<sub>2</sub> in natural ice.  
Stauffer, B., et al, *Journal of glaciology*, 1978, 21(85), p.291-300, In English with French and German summaries. 18 refs.  
Bernier, W.  
Ice composition, Gas inclusions, Carbon dioxide.
- 33-1875**  
Radio-frequency birefringence of polar ice.  
Hargreaves, N.D., *Journal of glaciology*, 1978, 21(85), p.301-313, In English with French and German summaries. 32 refs.  
Ice optics, Ice structure, Refractivity, Anisotropy.  
Radio-echo observations have shown that polar ice *in situ* is birefringent. The most likely explanation of the birefringence is an anisotropy in the radio-frequency dielectric constant of the ice single crystal, combined with the ordering of the orientations of the ice crystals in polar ice. It is possible to calculate the birefringence of ice which has a distribution of crystal orientations, using a technique similar to that used to derive the dielectric properties of heterogeneous media. The experimentally observed birefringence may then be shown to be consistent with the crystal orientation fabric at the site of the observations, if the anisotropy of the dielectric constant is slightly less than 1%, that is, slightly less than the accuracy of the laboratory measurements which have failed to detect any anisotropy. Further experimental observations might be used to obtain information on not only the level of anisotropy of the single crystal but also on the crystal orientation fabric of the ice. (Auth.)
- 33-1876**  
Dielectric permittivity of glacier ice measured *in situ* by radar wide-angle reflection.  
Jezek, K.C., et al, *Journal of glaciology*, 1978, 21(85), p.315-329, In English with French and German summaries. 28 refs.  
Clough, J.W., Bentley, C.R., Shabtaie, S.  
Glacier ice, Reflectivity, Ice dielectrics, Ice cover thickness, Dielectric properties.  
Values of relative permittivity measured by the wide-angle reflection technique on the Ross Ice Shelf show substantial variations between sites, from 3.09 to 2.89, with estimated errors of 0.03. The largest values, closest to those normally measured

in the laboratory, are found nearest to the grounded ice sheet; values decrease generally in the direction of thinner ice that has been longer on the ice shelf. We believe the variation reflects some real physical phenomenon in the ice shelf, either a true variation in the permittivity of the ice or a complication of the ray-path geometry, but are not able to offer a satisfactory model at present. (Auth. mod.)

33-1877

Activation energies of temperate snow samples. Traub, L.T., et al, *Journal of glaciology*, 1978, 21(85), p.331-339, In English with French and German summaries. 11 refs. Gribbon, P.W.F. Snow cover structure, Snow electrical properties, Electrical resistivity, Temperature effects, Grain size.

33-1878

Core structure and the mobility of dislocations in ice. Whitworth, R.W., *Journal of glaciology*, 1978, 21(85), p.341-359, In English with French and German summaries. 39 refs. Ice cores, Ice structure, Dislocations (materials), Proton transport.

33-1879

Cooperative movement of H<sub>2</sub>O molecules and dynamic behaviour of dislocations in ice Ih. Perez, J., et al, *Journal of glaciology*, 1978, 21(85), p.361-374, In English with French and German summaries. 25 refs. Mal, C., Vassolle, R. Hydrogen bonds, Ice structure, Ice crystals, Unfrozen water content, Dislocations (materials), Models.

33-1880

Inelastic behaviour of ice Ih single crystals in the low-frequency range due to dislocation. Vassolle, R., et al, *Journal of glaciology*, 1978, 21(85), p.375-384, In English with French and German summaries. 18 refs. Mal, C., Perez, J. Ice structure, Ice dislocations, Internal friction, Plastic deformation.

33-1881

Observation of basal dislocations in ice by etching and replicating. Sinha, N.K., *Journal of glaciology*, 1978, 21(85), p.385-395, In English with French and German summaries. 20 refs. Ice dislocations, Ice surface, Surface roughness, Laboratory techniques.

33-1882

X-ray topographic studies of dislocations in vapor-grown ice crystals. McKnight, C.V., et al, *Journal of glaciology*, 1978, 21(85), p.397-407, In English with French and German summaries. 21 refs. Hallett, J. Ice crystal structure, Dislocations (materials), Laboratory techniques, X ray analysis, Ice crystal nucleation.

33-1883

Studies of crystal imperfections in ice with reference to the growth process by the use of X-ray diffraction topography and divergent Laue method. Mizuno, Y., *Journal of glaciology*, 1978, 21(85), p.409-418, In English with French and German summaries. 14 refs. Ice crystal structure, Ice crystal growth, Dislocations (materials), X ray diffraction.

33-1884

Deformation mechanism map of ice. Shoji, H., et al, *Journal of glaciology*, 1978, 21(85), p.419-427, In English with French and German summaries. 23 refs. Higashi, A. Ice crystals, Ice deformation, Dislocations (materials), Maps.

33-1885

Creep activation energies of ice. Homer, D.R., et al, *Journal of glaciology*, 1978, 21(85), p.429-444, In English with French and German summaries. 47 refs. Glen, J.W. Ice crystals, Ice creep, Creep rate, Ice deformation, Strain tests.

33-1886

Deformation of ice single crystals close to the melting point. Jones, S.J., et al, *Journal of glaciology*, 1978, 21(85), p.445-455, In English with French and German summaries. 12 refs. Brunet, J.-G. Ice crystals, Ice deformation, Strain tests, Compressive properties.

33-1887

Short-term rheology of polycrystalline ice. Sinha, N.K., *Journal of glaciology*, 1978, 21(85), p.457-473, In English with French and German summaries. 40 refs. Ice deformation, Ice creep, Ice models.

33-1888

Effect of anisotropy on the creep of polycrystalline ice. Lile, R.C., *Journal of glaciology*, 1978, 21(85), p.475-483, In English with French and German summaries. 9 refs. Ice crystal structure, Ice creep, Ice models, Anisotropy.

33-1889

Influence of ice-crystal size on creep. Baker, R.W., *Journal of glaciology*, 1978, 21(85), p.485-500, In English with French and German summaries. 52 refs. Ice crystal structure, Strain tests, Ice growth, Ice creep, Ice crystal size.

33-1890

Creep of NaCl-doped ice monocrystals. Riley, N.W., et al, *Journal of glaciology*, 1978, 21(85), p.501-507, In English with French and German summaries. 18 refs. Noll, G., Glen, J.W. Ice creep, Impurities, Shear stress, Strains, Doped ice.

33-1891

On the relationships between low-density amorphous solid water and ice Ih. Rice, S.A., et al, *Journal of glaciology*, 1978, 21(85), p.509-535, In English with French and German summaries. 38 refs. Madden, W.G., McGraw, R., Sceats, M.G., Bergren, M.S. Amorphous ice, Ice crystal structure, Ice density, Molecular structure, Ice spectroscopy.

33-1892

Dynamical processes at the ice-water interface during solidification. Bilgram, J.H., et al, *Journal of glaciology*, 1978, 21(85), p.537-545, In English with French and German summaries. 7 refs. Glüttinger, H. Ice water interface, Ice crystal growth, Ice optics, Light scattering.

33-1893

Charge separation by collision of ice particles on metals: electronic surface states. Buser, O., et al, *Journal of glaciology*, 1978, 21(85), p.547-557, In English with French and German summaries. 19 refs. Jaccard, C. Ice electrical properties, Polarization (charge separation), Electric fields, Metals, Laboratory techniques, Wind tunnels.

33-1894

Optical absorption spectra of H<sub>2</sub>O ice doped with ytterbium chloride YbCl<sub>3</sub>. Couture, L., *Journal of glaciology*, 1978, 21(85), p.559-563, In English with French and German summaries. 8 refs. Doped ice, Ice composition, Impurities, Ice spectroscopy.

33-1895

Molecular orbital calculations of water-ice surface interactions. Plummer, P.L.M., *Journal of glaciology*, 1978, 21(85), p.565-580, In English with French and German summaries. 27 refs. Ice water interface, Molecular energy levels, Hydrogen bonds.

33-1896

Frazil nucleation mechanisms. Hanley, T.O., *Journal of glaciology*, 1978, 21(85), p.581-587, In English with French and German summaries. 23 refs. Frazil ice, Ice crystal nucleation, Nucleating agents, Supercooling, Turbulent flow.

33-1897

Structure and behaviour of grain boundaries in polycrystalline ice. Higashi, A., *Journal of glaciology*, 1978, 21(85), p.589-605, In English with French and German summaries. 24 refs. Ice crystal structure, Lattice models, Boundary value problems, X ray diffraction.

33-1898

Crystallographic structure of polycrystalline ice. Matsuda, M., et al, *Journal of glaciology*, 1978, 21(85), p.607-620, In English with French and German summaries. 41 refs. Wakahama, G. Ice mechanics, Ice crystal structure, Crystal structure.

33-1899

Anelastic behaviour of polycrystalline ice. Duval, P., *Journal of glaciology*, 1978, 21(85), p.621-628, In English with French and German summaries. 21 refs. Ice mechanics, Ice creep, Strains.

Torsion creep tests were performed on glacier ice at temperatures above -12°C. The polycrystalline ice, when unloaded, exhibits creep recovery. The time-dependent recoverable component of deformation (or anelastic strain) is described in a mathematical relationship. The anelastic modulus for times in excess of 3h is always smaller than the dynamic elastic modulus. The movement of dislocations composing the sub-boundaries or in dislocation pile-ups may produce this important reversible deformation. The time-dependent recovery is explained in a similar way to the transient creep behavior observed at low temperatures for metals. The small temperature dependence of creep recovery would arise from the existence of a distribution of internal stress values. The samples used were taken in the French Alps and in Terre Adélie, Antarctica. (Auth. mod.)

33-1900

X-ray diffraction topographic observations of the large-angle grain boundary in ice under deformation. Hondoh, T., et al, *Journal of glaciology*, 1978, 21(85), p.629-638, In English with French and German summaries. 9 refs. Higashi, A. Artificial ice crystals, X ray diffraction, Ice deformation, Boundary value problems.

33-1901

Regulation and the deformation of wet snow. Colbeck, S.C., et al, *Journal of glaciology*, 1978, 21(85), MP 1172, p.639-650, In English with French and German summaries. 17 refs. Parssinen, N.

Wet snow, Regulation, Snow deformation, Models. The thermodynamics of phase equilibrium control the temperature distribution around the ice particles in wet snow. When the snow is stressed, pressure melting occurs at the inter-particle contacts and the snow densifies. Densification is described by a physical model which simulates the heat flow, meltwater flow, and particle geometry. The effects of ionic impurities, liquid saturation, and particle size are demonstrated. Typical values of the temperature difference, inter-particle film size, and density are calculated as functions of time. The calculated rates of compaction are too large; hence, at some later time, the effects of simultaneous grain growth must be added to the model.

33-1902

Fracture toughness of ice: a preliminary account of some new experiments. Goodman, D.J., et al, *Journal of glaciology*, 1978, 21(85), p.651-660, In English with French and German summaries. 17 refs. Tabor, D.

Ice strength, Brittleness, Crack propagation, Fracturing, Temperature effects.

33-1903

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Valov, B.M.  
Drilling, Drilling fluids, Wells, Cements, Permafrost.
- 33-1962**  
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Permafrost distribution, Permafrost depth, Swamps, Land reclamation, Cryogenic soils, Land development, Taiga soils, Peat, Baykal Amur railroad.
- 33-1963**  
Winter operation of the Irtysh-Karaganda canal. (Osobennosti zimnei ekspluatatsii kanala Irtysh-Karaganda). Karnovich, V.N., et al. *Gidrotekhnika i melioratsiya*, Mar. 1978, No.3, p.45-49, In Russian. 4 refs.  
Water supply, Channels (waterways), Cold weather operation, Icebound rivers, Ice jams, Bottom ice, Polyayas.
- 33-1964**  
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Glacier ice, Glacier flow, Ecology, Glacial features, USSR—Baykal Lake.
- 33-1965**  
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Permafrost beneath rivers, Channels (waterways), Shore erosion, Streams, Floods, Banks (waterways), United States—Alaska.
- 33-1966**  
Ice, icing and ice breaking. National Research Council, Canada. Division of Mechanical Engineering. Low temperature Laboratory, *Transportation*, July 1977, 9(4), p.1-12, 14 refs.  
Aircraft icing, Ice adhesion, Ice removal, Deicing, Ice breaking, Ice formation, Hydraulic jets, Ice cutting.
- 33-1967**  
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DLC SB168.R9T49  
Tundra soils, Tundra vegetation, Alpine vegetation, Alpine soils, Taiga soils, Taiga vegetation, Plant ecology, Plant physiology, Biomass, Soil microbiology, Reforestation, Introduced plants.
- 33-1968**  
Origin of the Ural alpine flora in the light of ecologic-chorologic analysis. (Proiskhozhdenie vysokogornoi flory Urala v svete dannykh ekologo-khorologicheskogo analiza). Gorchakovskii, P.L., Vsesoiuznoe soveshchanie po voprosam izucheniia i osvoeniia flory i rastitel'nosti vysokogor'ii, 7th, Novosibirsk, Tezisy dokladov 1977, (All-Union Conference on Alpine Flora and Vegetation, 7th, Novosibirsk, 1977, Abstracts), Novosibirsk, 1977, p.18-20, In Russian.  
DLC SB168.R9T49  
Alpine soils, Alpine vegetation, Plant ecology, Ecosystems, Landscape types, USSR—Ural Mountains.
- 33-1969**  
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DLC SB168.R9T49  
Subarctic climate, Alpine vegetation, Alpine soils, Alpine tundra, Tundra soils, Tundra vegetation, USSR—Ural Mountains.
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DLC SB168.R9T49  
Forest soils, Alpine soils, Alpine vegetation, Plant ecology, Ecosystems, USSR—Sayan Mountains.
- 33-1971**  
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DLC SB168.R9T49  
Alpine soils, Alpine vegetation, Mosses, Plant ecology.
- 33-1972**  
Vertical distribution of hepatic mosses in Pamir-Alai. (K vertikal'nomu raspredeleniiu pechenochnykh mkhov Pamiro-Alai). Boboradzhov, V., Vsesoiuznoe soveshchanie po voprosam izucheniia i osvoeniia flory i rastitel'nosti vysokogor'ii, 7th, Novosibirsk, Tezisy dokladov 1977, (All-Union Conference on Alpine Flora and Vegetation, 7th, Novosibirsk, 1977, Abstracts), Novosibirsk, 1977, p.64-65, In Russian.  
DLC SB168.R9T49  
Alpine soils, Deserts, Alpine vegetation, Mosses, Plant ecology, Distribution.
- 33-1973**  
Preliminary results of karyologic investigations of alpine brioflora of the USSR. (Predvaritel'nye itogi kariologicheskogo issledovaniia brioflory gornyykh ralonov SSSR). Vysotskaia, E.I., Vsesoiuznoe soveshchanie po voprosam izucheniia i osvoeniia flory i rastitel'nosti vysokogor'ii, 7th, Novosibirsk, Tezisy dokladov 1977, (All-Union Conference on Alpine Flora and Vegetation, 7th, Novosibirsk, 1977, Abstracts), Novosibirsk, 1977, p.73-74, In Russian.  
DLC SB168.R9T49  
Mosses, Plant ecology, Alpine soils, Plant physiology.
- 33-1974**  
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DLC SB168.R9T49  
Alpine vegetation, Plant physiology, Mosses, Alpine soils, Plant ecology, Ecosystems.
- 33-1975**  
Place of highlands in the system of botanical-geographic regionalization of mountainous regions. (K voprosu o meste vysokogor'ii v sisteme botaniko-geograficheskogo ralonirovaniia gornyykh stran). Sokhadze, E.V., Vsesoiuznoe soveshchanie po voprosam izucheniia i osvoeniia flory i rastitel'nosti vysokogor'ii, 7th, Novosibirsk, Tezisy dokladov 1977, (All-Union Conference on Alpine Flora and Vegetation, 7th, Novosibirsk, 1977, Abstracts), Novosibirsk, 1977, p.101-102, In Russian.  
DLC SB168.R9T49  
Alpine land forms, Alpine vegetation, Geobotanical interpretation, Mapping, Plant ecology, Ecosystems.
- 33-1976**  
Large-scale mapping of alpine tundra vegetation in northern Ural Mountains at the level of phytocenosis complexes. (Krupnomasshtabnoe kartirovaniie rastitel'nosti gornyykh tundr Severnogo Urala na urovne kompleksov fitotsenozov). Famelis, T.V., et al. Vsesoiuznoe soveshchanie po voprosam izucheniia i osvoeniia flory i rastitel'nosti vysokogor'ii, 7th, Novosibirsk, Tezisy dokladov 1977, (All-Union Conference on Alpine Flora and Vegetation, 7th, Novosibirsk, 1977, Abstracts), Novosibirsk, 1977, p.108-109, In Russian.  
Nikonova, N.N.  
DLC SB168.R9T49  
Alpine tundra, Tundra vegetation, Alpine soils, Tundra soils, Ecosystems, Mapping.
- 33-1977**  
Fluctuation of horizontal structures of subalpine meadows. (Fluktuatsii gorizonta'noi struktury subal'pitskogo lugay). Evstratova, O.I., Vsesoiuznoe soveshchanie po voprosam izucheniia i osvoeniia flory i rastitel'nosti vysokogor'ii, 7th, Novosibirsk, Tezisy dokladov 1977, (All-Union Conference on Alpine Flora and Vegetation, 7th, Novosibirsk, 1977, Abstracts), Novosibirsk, 1977, p.119-120, In Russian.  
DLC SB168.R9T49  
Alpine soils, Alpine vegetation, Plant ecology, Ecosystems, Distribution.
- 33-1978**  
Biomass and productivity of lichens in Alpine tundras of the northern Ural Mountains and their variation in the course of succession. (Fitomassa i produktivnost' lishainikov v gornyykh tundrach Severnogo Urala i ikh izmenenie v khode suksessii). Kondrat'eva, M.A., Vsesoiuznoe soveshchanie po voprosam izucheniia i osvoeniia flory i rastitel'nosti vysokogor'ii, 7th, Novosibirsk, Tezisy dokladov 1977, (All-Union Conference on Alpine Flora and Vegetation, 7th, Novosibirsk, 1977, Abstracts), Novosibirsk, 1977, p.123-124, In Russian.  
DLC SB168.R9T49  
Alpine tundra, Tundra vegetation, Lichens, Biomass, Tundra soils, Plant ecology.

33-1979

Phytointroduction of man induced shifts of the upper forest boundary. (Fitoindikatsiia antropogennykh smeshchenii verkhnei granitsy lesa). Gorchakovskii, P.L., et al, Vsesoiuznoe soveshchanie po voprosam izucheniia i osvoeniia flory i rastitel'nosti vysokogor'ii, 7th, Novosibirsk, Tezisy dokladov 1977, (All-Union Conference on Alpine Flora and Vegetation, 7th, Novosibirsk, 1977, Abstracts), Novosibirsk, 1977, p.152-153, In Russian.

Shiitov, S.G.

DLC SB168.R9T49

Forest lines, Vegetation, Lichens, Mosses.

33-1980

Formation of alpine spruce forests in northern Tien Shan and their vegetation. (Nekotorye osobennosti formirovaniia vysokogorn'nykh el'nikov i ikh flory v Severnom Tian'-Shane). Roldugin, I.L., Vsesoiuznoe soveshchanie po voprosam izucheniia i osvoeniia flory i rastitel'nosti vysokogor'ii, 7th, Novosibirsk, Tezisy dokladov 1977, (All-Union Conference on Alpine Flora and Vegetation, 7th, Novosibirsk, 1977, Abstracts), Novosibirsk, 1977, p.161-162, In Russian.

DLC SB168.R9T49

Alpine soils, Alpine vegetation, Forest ecosystems, Forest lines, USSR—Tien Shan.

33-1981

State-of-the-art review on alpine ecosystems. (Sovremennoe sostoianie izucheniia vysokogorn'nykh ekosistem). Nakhutariashvili, G.Sh., Vsesoiuznoe soveshchanie po voprosam izucheniia i osvoeniia flory i rastitel'nosti vysokogor'ii, 7th, Novosibirsk, Tezisy dokladov 1977, (All-Union Conference on Alpine Flora and Vegetation, 7th, Novosibirsk, 1977, Abstracts), Novosibirsk, 1977, p.176-178, In Russian.

DLC SB168.R9T49

Alpine vegetation, Plant ecology, Ecosystems, Alpine soils.

33-1982

Vegetation effect on snow cover in alpine landscapes of Chernogora (Ukrainian Carpathian Mountains). (Vliianie rastitel'nosti na snezhnyi pokrov v vysokogorn'nykh landshtafakh Chernogory (Ukrainskie Karpaty)).

Tretiak, P.R., Vsesoiuznoe soveshchanie po voprosam izucheniia i osvoeniia flory i rastitel'nosti vysokogor'ii, 7th, Novosibirsk, Tezisy dokladov 1977, (All-Union Conference on Alpine Flora and Vegetation, 7th, Novosibirsk, 1977, Abstracts), Novosibirsk, 1977, p.181-182, In Russian.

DLC SB168.R9T49

Landscape types, Snow cover distribution, Vegetation factors, USSR—Carpathian Mountains.

33-1983

Guidebook for a botanical excursion to the Altai Mountains. (Putevoditel' botanicheskoi ekskursii v Gornyi Altai).

Krasnoborov, I.M., et al, Vsesoiuznoe soveshchanie po voprosam izucheniia i osvoeniia flory i rastitel'nosti vysokogor'ii, 7th, Novosibirsk, Tezisy dokladov 1977, (All-Union Conference on Alpine Flora and Vegetation, 7th, Novosibirsk, 1977, Abstracts), Novosibirsk, 1977, p.291-309, In Russian.

Ivanina, L.I.

DLC SB168.R9T49

Maps, Alpine vegetation, Ecosystems, Distribution, Plant ecology, Alpine soils, Alpine tundra, USSR—Altai Mountains.

33-1984

Compilation of abstracts.

Colloquium on Planetary Water and Polar Processes, 2nd, Hanover, N.H., Oct. 16-18, 1978, (1978), 77p., Refs. passim. For selected abstracts see 33-1985 through 33-2001.

Permafrost hydrology, Polar regions, Mars (planet), Planetary environments, Atmospheric composition, Ice formation, Water vapor, Cryogenic processes.

33-1985

Polar groundwater—a thermo-saline system. McGinnis, L.D., Colloquium on Planetary Water and Polar Processes, 2nd, Hanover, N.H., Oct. 16-18, 1978, (1978), p.6-8, 11 refs.

Ground water, Permafrost hydrology, Periglacial processes, Hydrogeology, Water flow, Thermal factors, Salinity, Antarctica—McMurdo Sound.

Hydrogeologic features discovered during the course of the Dry Valley Drilling Project in the McMurdo Sound suggest a dynamic—contemporary and ancient—hydrogeologic system, despite the fact that the mean annual sea level temperature has probably not risen above -18°C in the last several million years. This system is superimposed upon a static, freeze-immobilized,

permafrost terrain. A hole drilled into McMurdo Sound from sea ice, over 122m of water, encountered fresh water (probably ice) at 30 m below bottom. This water is terrestrial in origin and has been preserved at least since the last sea level lowering during Pleistocene time. Hydrochemical stratification evidenced in most DVDP boreholes reveals a record that is interpreted as alternating terrestrial and marine deposition.

33-1986

Nonlinear complex resistivity as a technique to study the state and chemistry of ground water.

Olhoeft, G.R., Colloquium on Planetary Water and Polar Processes, 2nd, Hanover, N.H., Oct. 16-18, 1978, (1978), p.9-11.

Ground water, Water chemistry, Electrical properties, Permafrost physics, Permafrost hydrology, Permafrost thermal properties.

33-1987

Diurnal and annual water cycles in cold planetary regoliths.

Philip, J.R., Colloquium on Planetary Water and Polar Processes, 2nd, Hanover, N.H., Oct. 16-18, 1978, (1978), p.12-15, 12 refs.

Mars (planet), Ice sublimation, Ground water, Condensing, Thermal conductivity, Periodic variations, Diurnal variations.

33-1988

Distribution of water in Martian regolith minerals.

Clark, B.C., Colloquium on Planetary Water and Polar Processes, 2nd, Hanover, N.H., Oct. 16-18, 1978, (1978), p.21-24, 4 refs.

Mars (planet), Permafrost hydrology, Soil moisture, Water vapor, Clay minerals.

33-1989

Mineralogical aspects of models for the storage of water in the Martian regolith.

Gooding, J.L., et al, Colloquium on Planetary Water and Polar Processes, 2nd, Hanover, N.H., Oct. 16-18, 1978, (1978), p.25-28, 8 refs.

Keil, K.

Permafrost hydrology, Mars (planet), Clay minerals, Soil moisture, Models.

33-1990

Effects of subsurface volatiles on the formation of Martian impact craters: photogeological and theoretical considerations.

Mouginis-Mark, P.J., Colloquium on Planetary Water and Polar Processes, 2nd, Hanover, N.H., Oct. 16-18, 1978, (1978), p.29-31, 4 refs.

Mars (planet), Permafrost hydrology, Surface roughness, Geomorphology, Soil moisture migration, Vapor pressure, Mathematical models, Photointerpretation, Theories, Volcanoes.

33-1991

Possible importance of palagonization on Mars.

Wenner, D.B., Colloquium on Planetary Water and Polar Processes, 2nd, Hanover, N.H., Oct. 16-18, 1978, (1978), p.35-37, 12 refs.

Volcanoes, Permafrost hydrology, Mars (planet), Rocks.

33-1992

Mars permafrost sampling problems.

Stephens, J., Colloquium on Planetary Water and Polar Processes, 2nd, Hanover, N.H., Oct. 16-18, 1978, (1978), p.38-39.

Permafrost samplers, Permafrost hydrology, Mars (planet), Sampling, Soil moisture.

33-1993

Endogenic processes on low density satellites: Gany-mede and Callisto.

Head, J.W., et al, Colloquium on Planetary Water and Polar Processes, 2nd, Hanover, N.H., Oct. 16-18, 1978, (1978), p.40-43, 5 refs.

Parmentier, E.M.

Extraterrestrial ice, Planetary environments, Thermal stresses, Gravity, Volcanoes, Topographic features.

33-1994

Comparison of some permafrost features on Earth and Mars: some cautions and restrictions.

Black, R.F., Colloquium on Planetary Water and Polar Processes, 2nd, Hanover, N.H., Oct. 16-18, 1978, (1978), p.45-47.

Permafrost indicators, Permafrost origin, Mars (planet), Patterned ground.

33-1995

Survey of cold-climate features on Mars.

Lucchitta, E.K., Colloquium on Planetary Water and Polar Processes, 2nd, Hanover, N.H., Oct. 16-18, 1978, (1978), p.48-51, 20 refs.

Mars (planet), Permafrost weathering, Patterned ground, Thermoharst, Volcanoes, Glacial erosion, Periglacial processes.

33-1996

Terrestrial analogs for Martian striped ground.

Rossbacher, L.A., Colloquium on Planetary Water and Polar Processes, 2nd, Hanover, N.H., Oct. 16-18, 1978, (1978), p.52-55, 14 refs.

Patterned ground, Mars (planet), Permafrost weathering.

33-1997

Outflow features in Kasei and Maja Valles, Mars.

Baker, V.R., et al, Colloquium on Planetary Water and Polar Processes, 2nd, Hanover, N.H., Oct. 16-18, 1978, (1978), p.56-59, 15 refs.

Kochel, R.C.

Mars (planet), Geomorphology, Mapping, Permafrost weathering, Soil erosion.

33-1998

Frost streaks in the south polar cap of Mars.

Thomas, P., et al, Colloquium on Planetary Water and Polar Processes, 2nd, Hanover, N.H., Oct. 16-18, 1978, (1978), p.61-63.

Veverka, J.

Mars (planet), Frost, Seasonal variations, Albedo, Carbon dioxide, Wind direction, Atmospheric circulation, Polar atmospheres.

33-1999

Investigations of Martian polar stratigraphy, structure, and topography.

Howard, A.D., Colloquium on Planetary Water and Polar Processes, 2nd, Hanover, N.H., Oct. 16-18, 1978, (1978), p.70-71, 2 refs.

Mars (planet), Polar regions, Stratigraphy, Structural analysis, Topographic features, Permafrost weathering, Landforms, Frost action, Wind factors.

33-2000

On the survival of organic compounds in the polar regions of Mars.

Pang, K., et al, Colloquium on Planetary Water and Polar Processes, 2nd, Hanover, N.H., Oct. 16-18, 1978, (1978), p.74-75, 4 refs.

Chun, S., Ajello, J.

Photochemical reactions, Planetary environments, Mars (planet), Polar regions, Laboratory techniques. Photochemical synthesis and meteoritic infall can produce a contemporary accumulation of organic compounds on Mars. The recent discovery of pristine samples of carbonaceous chondrites in Antarctica raises the possibility that such meteorites, rich in organic compounds, may also be preserved in the polar regions of Mars, as in the blue ice of Antarctica.

33-2001

Eolian processes in the polar regions, Earth and Mars.

Grolier, M.J., et al, Colloquium on Planetary Water and Polar Processes, 2nd, Hanover, N.H., Oct. 16-18, 1978, (1978), p.76-77, 6 refs.

Breed, W.J., McCauley, J.F., Breed, C.S.

Eolian soils, Mars (planet), Ice conditions, Landforms, Permafrost weathering, Polar regions, Temperature effects, Wind factors.

33-2002

Ross Ice Shelf Project.

Clough, J.W., et al, *Science*, Feb. 2, 1979, 203(4379), p.433-434, 16 refs.

Hansen, B.L.

Ice shelves, Ice temperature, Drilling, Antarctica—Ross Ice Shelf.

A hole was drilled through the Ross Ice Shelf 450 km from the barrier. Scientific sampling through this hole revealed a sparse population of crustaceans, fish, and microbial biomass. The seabed consists of mid-Miocene glaciomarine mud. Geothermal heat flow is average. Oceanographic data indicate an active circulation and melting at the base of the ice. (Auth.)

33-2003

Miocene glaciomarine sediments from beneath the southern Ross Ice Shelf, Antarctica.

Webb, P.N., et al, *Science*, Feb. 2, 1979, 203(4379), p.435-437, 14 refs.

Ronan, T.E., Jr., Lipps, J.H., DeLaca, T.E.

Glacial deposits, Subglacial observations, Sediments, Grain size, Antarctica—Ross Ice Shelf.

Glaciomarine sediments with middle Miocene microfossil assemblages are exposed at the sea floor below the southern Ross Ice Shelf. Plio-Pleistocene sediments are not present. Post-Miocene glacial sediments may have been deposited but removed by relatively recent ice shelf grounding. A meager Recent microfauna is present in some core tops. (Auth.)

33-2004

Ross Ice Shelf sea temperature.

Gilmour, A.E., *Science*, Feb. 2, 1979, 203(4379), p.438-439, 6 refs.

Ice shelves, Ice melting, Ice water interface, Water temperature, Antarctica—Ross Ice Shelf.

Two temperature profiles recorded by a sensitive bathythermograph at the Ross Ice Shelf Project site are presented. From the shape of the profiles it is concluded that an inflow of water at intermediate depths provides a source of heat to drive a

regime in which ice is melted from the interface at a depth of 360 m. Melting maintains the temperature of a thick layer under the ice at about -2.14°C, close to the ambient freezing temperature. A very well-mixed layer about 35 m thick was found at the seabed. (Auth.)

**33-2005**  
**Circulation and melting beneath the Ross Ice Shelf.** Jacobs, S.S., et al, *Science*, Feb. 2, 1979, 203(4379), p.439-443, 23 refs.

Gordon, A.L., Ardai, J.L., Jr.  
**Subglacial observations, Ice shelves, Ice melting, Ice water interface, Ice heat flux, Sea water freezing, Antarctica—Ross Ice Shelf.**

Heat is supplied by seawater that moves southward beneath the ice shelf from a central warm core and from a western region of high salinity. The near-freezing Ice Shelf Water produced flows northward into the Ross Sea. (Auth.)

**33-2006**  
**Terrestrial ages of four Allan Hills meteorites: consequences for antarctic ice.**

Fireman, E.L., et al, *Science*, Feb. 2, 1979, 203(4379), p.453-455, 17 refs.

Rancitelli, L.A., Kirsten, T.  
**Ice sheets, Ice dating.**

The terrestrial ages of three Allan Hills meteorites are between 30,000 and 300,000 yr and one is 1,540,000 yr old. The antarctic ice sheet is therefore older than 1,540,000 yr, and the meteorite accumulation process at Allan Hills probably began between 30,000 and 300,000 yr ago. (Auth.)

**33-2007**  
**Climatic change and variability: a southern perspective.**

Pittcock, A.B., ed, New York, Cambridge University Press, 1978, 455p., Based on a conference at Monash University, Melbourne, Australia, 7-12 December 1975.

DLC QC981.8.C5C56  
**Climatic changes, Ice sheets, Glacier surges.**

This volume contains a number of papers that were presented at a conference and later organized under the following headings: physical basis of climate; long-term climatic record; patterns of short-term change and variability; models of climatic change; modification of climate; effect of climate change and variability on man; and progress and prospect. For selected papers see F-21113, I-21106 through I-21112, or 33-2008 through 33-2012.

**33-2008**  
**Role of the oceans.**

Hamon, B.V., et al, *Climatic change and variability: a southern perspective*, New York, Cambridge University Press, 1978, p.31-52.

Godfrey, J.S.  
DLC QC981.8.C5C56

**Climatic changes, Ice cover effect.**

Large-scale features of the structure and circulation of the southern hemisphere oceans, including the major water-mass boundaries and the antarctic pack ice, are discussed. The authors describe some implications of ocean dynamics for climatology.

**33-2009**

**Climatic and topographic changes from glaciological data.**

Jenssen, D., *Climatic change and variability: a southern perspective*, New York, Cambridge University Press, 1978, p.77-81.

DLC QC981.8.C5C56  
**Climatic changes, Ice sheets.**

Isotope ratios indicating surface temperature variations will correspond to lower temperature simply due to higher surface elevations as well as to climatic change. How to separate the indications of elevation change from those of true climatic fluctuations was the problem the author addressed. He develops a theory and model, then compares results with observed data from Camp Century, Vostok and Byrd cores, showing many similarities.

**33-2010**

**Abrupt events in climatic history.**

Flohn, H., *Climatic change and variability: a southern perspective*, New York, Cambridge University Press, 1978, p.124-134.

DLC QC981.8.C5C56  
**Climatic changes, Ice sheets, Glacier surges.**

Three possible external causes for abrupt climatic changes are discussed: solar events (a change in the solar constant); frequent volcanic activity; and a surge of the antarctic ice sheet. The author proposes that an antarctic surge, potentially catastrophic in its effect on world climate, could be perhaps prevented by concerted international efforts if early warning were provided by sea ice monitoring.

**33-2011**

**Theories of Upper Quaternary ice ages.**

Chappell, J., *Climatic change and variability: a southern perspective*, New York, Cambridge University Press, 1978, p.211-225.

DLC QC981.8.C5C56  
**Ice age theory, Ice sheets, Glacier surges.**

The author reviews the status of various theories concerning the triggering of ice ages. With regard to the idea that periodic ma-

JOR surges of the antarctic ice sheet may be a causal factor, he comments that, although conclusive evidence has not been adduced for this theory yet, particularly by proving a sudden rise in a sea level followed by a slower eustatic fall, antarctic surging is still a possible explanation for ice age initiation.

**33-2012**  
**Modelling surging glaciers and periodic surging of the Antarctic ice sheet.**

Budd, W., et al, *Climatic change and variability: a southern perspective*, New York, Cambridge University Press, 1978, p.228-233.

McInnes, B.  
DLC QC981.8.C5C56

**Climatic changes, Ice sheets, Glacier surges.**

The authors discuss their model for glacier surge in terms of the characteristics of the Wilkes Land ice sheet, the Lambert-Amery basin, and the West Antarctic-Ross basin. It appears that, if the model is valid for the areas studied, the present profile is one typical of the post-surge slow buildup stage, not the pre-surge state considered by some glaciologists to presage an ice age.

**33-2013**

**Effect of sanding: traffic and friction studies. (Effekter av sanding: trafik- och friktionsstudier.)**

Öberg, G., Sweden. *Statens väg- och trafikinstitut. Rapport*, 1978, No.164, 53p. + appends., In Swedish with English summary. 13 refs.

**Anticing additives, Sanding, Rubber ice friction, Trafficability, Winter maintenance, Road maintenance, Road icing, Friction, Tests.**

**33-2014**

**Lagoon sewage treatment for the Antarctic and sub-Arctic.**

Grainge, J.W., et al, Unpublished manuscript, 30p. + figs., Prepared for the Environmental Protection Agency Technology Transfer Seminar, Anchorage, Alaska, March 28-29, 1972. 9 refs.

Greenwood, J.K., Shaw, J.W.  
**Ponds, Sewage treatment, Waste treatment, Permafrost preservation, Cold weather performance, Tundra, Standards.**

**33-2015**

**Cyclone switch heater for railway track switches.**

Part 2. Prototype performance evaluation. Coveney, D.B., *National Research Council, Canada. Division of Mechanical Engineering. Laboratory technical report*, Jan. 1979, LTR-LT-93, 19p., 5 refs.

**Railroad equipment, Cold weather operation, Electric heating.**

**33-2016**

**Sea ice laser statistics.**

Welsh, J.F., et al, *International Symposium on Remote Sensing of Environment*, 7th, May 17-21, 1971, Ann Arbor, University of Michigan, p.1165-1175, 4 refs.

Tucker, W.B.  
**Sea ice distribution, Pack ice, Ice surface, Lasers, Airborne equipment, Computer applications, Statistical analysis.**

**33-2017**

**Proceedings: 1977 Oil Spill Conference (Prevention, Behavior, Control, Cleanup).**

Oil Spill Conference, New Orleans, Louisiana, March 8-10, 1977. American Petroleum Institute. Publication No.4284, Washington, D.C., American Petroleum Institute, 640p., Refs. passim. For selected papers see 33-2018 through 33-2025.

**Oil spills, Countermeasures, Detection, Environmental impact, Pollution, Airborne equipment, Sea ice.**

**33-2018**

**U.S. Coast Guard airborne oil surveillance system status report.**

Maurer, A.T., et al, 1977 Oil Spill Conference (Prevention, Behavior, Control, Cleanup), New Orleans, Louisiana, March 8-10, 1977. Proceedings, Washington, D.C., American Petroleum Institute, p.215-219, 2 refs.

Edgerton, A.T., Meeks, D.C.  
**Oil spills, Detection, Pollution, Airborne equipment, Sea ice distribution.**

**33-2019**

**Oil slick spreading beneath a uniform ice cover in the presence of a current.**

Weiskopf, E.B., et al, 1977 Oil Spill Conference (Prevention, Behavior, Control, Cleanup), New Orleans, Louisiana, March 8-10, 1977. Proceedings, Washington, D.C., American Petroleum Institute, p.297-300, 6 refs.

Uzun, M.S.  
**Oil spills, Subglacial observations, Dispersions, Ice cover effect, Ocean currents, Distribution.**

**33-2020**

**Development of an oil spill recovery system for arctic operation.**

Scharfenstein, C.F., et al, 1977 Oil Spill Conference (Prevention, Behavior, Control, Cleanup), New Orleans, Louisiana, March 8-10, 1977. Proceedings, Washington, D.C., American Petroleum Institute, p.301-302.

Hoard, M.G.  
**Equipment, Oil spills, Oil recovery, Countermeasures, Tests, Ice conditions.**

**33-2021**

**Application of existing oil spill abatement equipment to cold regions.**

Schultz, L.A., et al, 1977 Oil Spill Conference (Prevention, Behavior, Control, Cleanup), New Orleans, Louisiana, March 8-10, 1977. Proceedings, Washington, D.C., American Petroleum Institute, p.309-311, 6 refs.

Deslauriers, P.C.  
**Oil spills, Countermeasures, Equipment, Oil recovery, Detection, Cold weather tests.**

**33-2022**

**Arctic offshore oil spill countermeasures with emphasis on an oil and gas blowout in the southern Beaufort Sea.**

Thornton, D.E., et al, 1977 Oil Spill Conference (Prevention, Behavior, Control, Cleanup), New Orleans, Louisiana, March 8-10, 1977. Proceedings, Washington, D.C., American Petroleum Institute, p.313-319, 14 refs.

Ross, S.L., Logan, W.J., Ross, C.W.  
**Gases, Oil spills, Countermeasures, Sea ice, Subglacial observations.**

**33-2023**

**Storm related oil spill movement on the Beaufort Sea shelf.**

Hufford, G.L., et al, 1977 Oil Spill Conference (Prevention, Behavior, Control, Cleanup), New Orleans, Louisiana, March 8-10, 1977. Proceedings, Washington, D.C., American Petroleum Institute, p.455-460, 11 refs.

Lissauer, I.M., Thompson, B.D.  
**Oil spills, Dispersions, Storms, Wind factors, Distribution, Beaufort Sea.**

**33-2024**

**Fate of crude oil spilled in a simulated arctic environment.**

MacGregor, C., et al, 1977 Oil Spill Conference (Prevention, Behavior, Control, Cleanup), New Orleans, Louisiana, March 8-10, 1977. Proceedings, Washington, D.C., American Petroleum Institute, p.461-463, 7 refs.

McLean, A.Y.  
**Oil spills, Low temperature tests, Monitors, Physical properties, Chemical properties, Laboratory techniques.**

**33-2025**

**Microorganisms and hydrocarbons in the North Sea during July-August 1975.**

Oppenheimer, C.H., et al, 1977 Oil Spill Conference (Prevention, Behavior, Control, Cleanup), New Orleans, Louisiana, March 8-10, 1977. Proceedings, Washington, D.C., American Petroleum Institute, p.593-609, 1 ref.

Gunkel, W., Gassmann, G.  
**Oil spills, Countermeasures, Microbiology, Hydrocarbons, Bacteria, North Sea.**

**33-2026**

**JATO rocket motor Marz 6, Mod 1, Antarctic test program.**

Magnelli, D.D., *U.S. Naval Ordnance Station Indian Head technical report*, Sep. 15, 1978, NOS-IHTR-510, 68p. ADB 030 113.

**Airplanes, Engines, Cold weather tests, Antarctica.**

A two-phase program was conducted to determine the necessity for continued structural modifications to the JATO rocket motor Mk 6 Mod 1 hangers for use in antarctic operations on LC-130 aircraft. Phase I was the acquisition of shock and vibration loads experienced by the JATO motors during actual aircraft takeoffs from antarctic field stations. The worst case conditions measured were experienced during JATO takeoff from Dome Charlie Station. Phase II was the analysis of the data and the formulation and conduct of a vibration test at Indian Head of 12 motors, simulating the worst case conditions experienced in Antarctica. It was concluded that the unmodified JATO motor hangers were adequate for use under the most extreme antarctic conditions. (Auth.)

## 33-2027

Proceedings, Vol.2.  
International Symposium on Winter Concreting, 2d, Moscow, Oct. 14-16, 1975, Moscow, Stroizdat, 1975, 375p., In Russian, English and French with English, French and Russian summaries. For individual papers see 33-2028 through 33-2064. Refs. passim.  
DLC TA682.43.157  
Winter concreting, Reinforced concrete, Prestressed concrete, Cements, Cement additives, Concrete admixtures, Concrete aggregates, Moisture content, Concrete freezing, Electric heating, Concrete strength, Concrete hardening, Concrete structures, Concrete piles.

## 33-2028

Corrosion resistance of "cold" concretes. (Korroziionnaya stolkost' "khododnykh" betonov). Alimov, Sh.S., et al. International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Stroizdat, 1975, p.7-13, In Russian. English summary p.422.  
Koroleva, O.E., Kireeva, I.U.I.  
DLC TA682.43.157  
Winter concreting, Concrete freezing, Concrete admixtures, Antifreezes, Concrete placing.

## 33-2029

Concrete hardening mechanism during early freezing. (Mekhanizm uprochneniya betona pri ego ranнем zamorazhivani). Akhverdov, I.N., et al. International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Stroizdat, 1975, p.14-22, In Russian. English summary p.422. 13 refs.  
Kaplan, E.L.  
DLC TA682.43.157  
Winter concreting, Concrete freezing, Concrete hardening, Concrete strength, Concrete aggregates, Cements, Freeze thaw cycles.

## 33-2030

Peculiarities of concrete hardening in permafrost. (Osobennosti tverdeniya betona v vechnomerzlykh gruntakh). Bugrim, S.F., International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Stroizdat, 1975, p.23-33, In Russian. English summary p.424.  
DLC TA682.43.157  
Winter concreting, Concrete hardening, Concrete placing, Moisture transfer, Cements, Ice crystal formation, Permafrost, Analysis (mathematics).

## 33-2031

Cements and admixtures for winter concreting. (Choix des ciments et des adjuvants pour la confection des bétons mis en oeuvre par temps froid). Venuat, M., International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Stroizdat, 1975, p.34-43, In French. Russian summary p.425.  
DLC TA682.43.157  
Winter concreting, Concrete aggregates, Cements, Cement additives, Concrete freezing, Concrete hardening, Moisture transfer, Heat flux.

## 33-2032

Development in quality control of concrete during paving. Wilk, W., et al. International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Stroizdat, 1975, p.43-82, Russian summary p.475.  
Dobrolubov, G., Reiner, B.  
DLC TA682.43.157  
Pavements, Concrete structures, Porosity, Winter concreting, Concrete hardening, Concrete strength, Tests, Laboratory techniques, Roads.

## 33-2033

Compressive strength of concrete in winter—a probabilistic simulation. Visvesvaraya, H.C., et al. International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Stroizdat, 1975, p.83-103, Russian summary p.427. 15 refs.  
Mullick, A.K.  
DLC TA682.43.157  
Winter concreting, Mathematical models, Concrete aggregates, Cements, Concrete admixtures, Concrete hardening, Concrete freezing, Concrete strength, Compressive strength.

## 33-2034

Relative strength of heat cured concrete. (Issledovanie otositel'noi prochnosti betona pri termosnom tverdenii). Vylev, V.N., International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Stroizdat, 1975, p.104-115, In Russian. English summary p.430.  
DLC TA682.43.157  
Winter concreting, Concrete hardening, Moisture transfer, Concrete freezing, Cements, Concrete heating, Concrete strength.

## 33-2035

Influence of concrete freezing at early and ripe age on its strength and deformation. (Vliianie zamorazhivaniya betona v ranнем i zreлом vozraste na ego prochnost' i deformativnost'). Glazyrina, E.G., et al. International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Stroizdat, 1975, p.116-129, In Russian. English summary p.430. 6 refs.  
Iarmakovskii, V.N.  
DLC TA682.43.157  
Winter concreting, Concrete freezing, Concrete hardening, Deformation, Concrete strength.

## 33-2036

Thermal deformation and resistance of concrete frozen at an early age. (Temperaturnye deformatsii i stolkost' betonov pri zamorazhivani v ranнем vozraste). Gorchakov, G.I., et al. International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Stroizdat, 1975, p.129-145, In Russian. English summary p.432. 5 refs.  
DLC TA682.43.157  
Winter concreting, Concrete hardening, Moisture transfer, Ice crystal formation, Concrete strength.

## 33-2037

Progressive hardening of concretes at low temperatures. (La progression des résistances des bétons par basses températures). Dubois, J., et al. International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Stroizdat, 1975, p.145-162, In French. Russian summary p.433. 9 refs.  
Ammar, C., Dutron, P., Motteau, H.  
DLC TA682.43.157  
Winter concreting, Concrete placing, Concrete hardening, Concrete curing, Concrete freezing.

## 33-2038

Variations in strength and deformation properties of light and heavy concretes after freezing. (Izmenenie prochnostnykh i deformativnykh kharakteristik legkogo i tiazhelogo betonov posle zamorazhivaniya). Zhitkevich, R.K., et al. International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Stroizdat, 1975, p.163-169, In Russian. English summary p.436.  
Kurasova, G.P., Istomin, A.S.  
DLC TA682.43.157  
Winter concreting, Concrete freezing, Concrete hardening, Concrete strength.

## 33-2039

Freezing effect on the physical and mechanical properties of agglomerate concretes. (Vliianie zamorazhivaniya agglomeratobetona na ego fiziko-mekhanicheskie svoystva). Izraelit, M.M., et al. International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Stroizdat, 1975, p.170-178, In Russian. English summary p.436. 7 refs.  
Golovnev, E.A.  
DLC TA682.43.157  
Concrete freezing, Concrete strength, Concrete aggregates, Cements, Concrete curing, Concretes.

## 33-2040

Physical and chemical processes in freezing concretes. (Fiziko-khimicheskie protsessy v betone pri ego zamorazhivani). Ivanova, O.S., et al. International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Stroizdat, 1975, p.178-191, In Russian. English summary p.438. 4 refs.  
Belova, L.A.  
DLC TA682.43.157  
Winter concreting, Concrete hardening, Concrete freezing, Moisture transfer, Phase transformations, Ice formation, Cements.

## 33-2041

Cement stone deformation due to the freezing of pore water. (Zamerzanie vody v porakh tsementnogo kamnia i ego deformatsiya). Krasil'nikov, K.G., et al. International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Stroizdat, 1975, p.191-195, In Russian. English summary p.438. 2 refs.  
Tarasov, A.F.  
DLC TA682.43.157  
Winter concreting, Concrete aggregates, Cements, Concrete freezing, Moisture transfer, Phase transformations, Frost shattering.

## 33-2042

Technological means of decreasing deterioration of concretes frozen at an early age. (Tekhnologicheskie sposoby snizheniya destruktivnosti betonov, zamorozhennykh v ranнем vozraste). Lagofova, A.V., et al. International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Stroizdat, 1975, p.196-203, In Russian. English summary p.440.  
Larina, O.P., Ukhov, E.N.  
DLC TA682.43.157  
Winter concreting, Concrete freezing, Moisture transfer, Concrete hardening, Phase transformations, Damage, Concrete strength, Concrete admixtures.

## 33-2043

Prehardening period needed to protect fresh concrete from frost. (Durée de prédurcissement nécessaire pour protéger le béton du gel). Mamillan, M., International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Stroizdat, 1975, p.204-215, In French. English summary p.440. Russian summary p.439.  
DLC TA682.43.157  
Winter concreting, Concrete hardening, Concrete freezing, Freezing rate, Moisture content, Phase transformations.

## 33-2044

Thermal-image method of testing the strength of reinforced concrete articles. (Epruvettes-images thermiques d'un ouvrage en béton-armoire de régulation). Martinet, C., International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Stroizdat, 1975, p.216-227, In French. Russian summary p.441.  
DLC TA682.43.157  
Prefabrication, Reinforced concrete, Concrete strength, Concrete curing, Tests, Laboratory techniques.

## 33-2045

On development of concrete strength under winter concreting conditions. Kykänen, J., International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Stroizdat, 1975, p.228-240, Russian summary p.443. 8 refs.  
DLC TA682.43.157  
Winter concreting, Concrete strength, Concrete hardening, Concrete freezing, Cements, Computer applications, Analysis (mathematics).

## 33-2046

Use of regulated-set cement in cold weather environments. Scanlon, J.M., Jr., et al. International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Stroizdat, 1975, p.241-252, Russian summary p.445. 10 refs.  
Hoff, G.C., Houston, B.J., Sayles, F.H.  
DLC TA682.43.157  
Winter concreting, Concrete aggregates, Cements, Cement additives, Concrete freezing.

## 33-2047

Theoretical principles of concrete and cement stone resistance to freeze-thaw cycles. (O teoreticheskikh osnovakh soprotivliamosti tsementnogo kamnia i betonov tsiklam zamorazhivaniya i ottaivaniya). Stol'nikov, V.V., International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Stroizdat, 1975, p.253-263, In Russian. English summary p.448. 10 refs.  
DLC TA682.43.157  
Porous materials, Concretes, Cements, Grouting, Freeze thaw cycles, Frost resistance.

33-2048

Application of Young's modulus in evaluation of damage to concrete from freezing.

Takabayashi, T., International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Stroizdat, 1975, p.264-269, Russian summary p.447. DLC TA682.43.157

Frost shattering, Winter concreting, Concrete hardening, Concrete freezing, Frost resistance, Analysis (mathematics).

33-2049

High frost resistance reinforced concretes for building tall structures in freezing weather. (Betony vysokoi morozostoikosti dlia vysotnykh zhelezobetonnykh sooruzhenii, vozvodimykh v zimnee vremia), Trinker, B.D., et al, International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Stroizdat, 1975, p.270-281, In Russian. English summary p.450. 10 refs. Demina, G.G., Zhits, G.N. DLC TA682.43.157

Concrete structures, Reinforced concrete, Frost resistance, Winter concreting, Concrete strength, Concrete aggregates, Cements, Concrete admixtures.

33-2050

Temperature and strength fields and internal stresses originating during cooling of solid concrete foundations. (Temperaturnye i prochnostnye polia, vnutrennie napriazheniia pri okhlazhdenii monolitnykh fundamentov), IUnusov, N.V., et al, International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Stroizdat, 1975, p.281-292, In Russian. English summary p.450. 4 refs. Popkovich, G.E., Val't, A.B. DLC TA682.43.157

Concrete structures, Foundations, Concrete curing, Concrete heating, Concrete placing, Concrete freezing, Strains, Moisture transfer, Ice formation, Analysis (mathematics), Thermal stresses.

33-2051

Effect of subzero temperatures on the contact between hardening cement solutions and concrete aggregates. (Formirovanie kontakta tsementnogo kamnia s zapolniteliami v betonakh pri vozdeistvii otritsatel'nykh temperatur), IArushkina, S.Kh., International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Stroizdat, 1975, p.292-299, In Russian. English summary p.452. DLC TA682.43.157

Concretes, Winter concreting, Concrete aggregates, Cements, Concrete hardening, Concrete freezing, Concrete strength.

33-2052

Winter concreting north of the Arctic circle. (O zimnem betonirovanii v Zapoliar'e), Bernshein, L.B., et al, International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Stroizdat, 1975, p.299-305, In Russian. English summary p.452. 7 refs. Usachev, I.N. DLC TA682.43.157

Winter concreting, Concrete aggregates, Heating, Concrete placing, Concrete curing, Concrete hardening, Concrete strength.

33-2053

Transport of fresh concrete under winter conditions. Vaulamo, R., et al, International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Stroizdat, 1975, p.305-314, Russian summary p.453. 16 refs. Tammiah, P. DLC TA682.43.157

Transportation, Winter concreting, Concrete freezing, Concrete aggregates, Heating, Concretes.

33-2054

Winter concreting in Bulgaria. (Obenosti betonirovania v zimnikh usloviakh Narodnoi Respubliki Bolgarii), Karapchanski, N.I., et al, International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Stroizdat, 1975, p.316-323, In Russian. English summary p.454. Tabakov, S.V. DLC TA682.43.157

Winter concreting, Concrete aggregates, Cements, Cement additives, Concrete placing, Concrete hardening, Concrete freezing, Concrete strength.

33-2055

Load-bearing joints between precast concrete units in winter conditions.

Kaitila, H., et al, International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Stroizdat, 1975, p.323-334, Incomplete paper. Russian summary p.455. 7 refs. Villberg, L. DLC TA682.43.157

Winter concreting, Concrete aggregates, Cements, Mortars, Concrete hardening, Concrete freezing, Prefabrication, Precast concrete, Joints (junctions), Grouting.

33-2056

Heat treatment of cast-in-place structures in freezing weather. (Isopol'zovanie elektrotermoobrabotki pri zimnem betonirovanii monolitnykh konstruktсий), Li, A.I., International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Stroizdat, 1975, p.335-345, In Russian. English summary p.456. DLC TA682.43.157

Winter concreting, Concrete placing, Concrete heating, Electric heating, Concrete hardening, Concrete strength, Frost resistance.

33-2057

Steam-curing of concrete in freezing weather. (Osobenosti teplovlazhnostnoi obrabotki betona v zimnikh usloviakh), Malinina, L.A., et al, International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Stroizdat, 1975, p.346-355, In Russian. English summary p.458. 8 refs. Malinskii, E.N. DLC TA682.43.157

Prefabrication, Concrete curing, Concrete heating, Reinforced concrete, Concrete placing, Concrete hardening, Concrete freezing, Concrete strength, Concretes.

33-2058

Technology of casting reinforced concrete structures in heated forms. (Tekhnologiya obogreva monolitnykh zhelezobetonnykh konstruktсий v termoaktivnoi opalubke), Ovsiankin, V.I., et al, International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Stroizdat, 1975, p.355-367, In Russian. English summary p.458. DLC TA682.43.157

Winter concreting, Formwork (construction), Electric heating, Reinforced concrete, Concrete heating, Concrete hardening, Concrete placing.

33-2059

Electrically heated large size moulds. Penttala, V., et al, International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Stroizdat, 1975, p.367-376, Russian summary p.459. 6 refs. Markkola, E. DLC TA682.43.157

Winter concreting, Concrete placing, Formwork (construction), Electric heating, Concrete heating.

33-2060

Computerized simulation of the thermos concrete curing technique. (Matematicheskoe modelirovanie rezhimov termosnogo vyderzhivaniia betona s ispol'zovaniem EVM), Petrov-Denisov, V.G., et al, International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Stroizdat, 1975, p.377-385, In Russian. English summary p.460. 3 refs. Dudnikov, I.V., Matichenko, A.I. DLC TA682.43.157

Winter concreting, Concrete curing, Concrete placing, Concrete hardening, Computerized simulation.

33-2061

Heated forms used for steam-curing of concrete at the construction site of the Kama Motor Vehicle Complex. (Opyt primeneniia elektrotermoobrabotki betona s ispol'zovaniem greishchei opalubki na stroitel'stve Kamskogo Avtomobleksaj), Pizhov, A.I., et al, International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Stroizdat, 1975, p.386-395, In Russian. English summary p.462. 2 refs. DLC TA682.43.157

Winter concreting, Concrete curing, Formwork (construction), Electric heating.

33-2062

Application of the thermos technique and preliminary electric heating of mixtures in winter concreting. (Oblast' primeneniia metoda termos i predvaritel'nogo elektrorazogreva betonnoi smesi pri zimnem betonirovanii), Sizov, V.N., et al, International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Stroizdat, 1975, p.395-401, In Russian. English summary p.462. Vegener, R.V., Mikalichenko, V.M. DLC TA682.43.157

Winter concreting, Concrete curing, Formwork (construction), Electric heating.

33-2063

Technical and economic evaluation of winter concreting methods in different climatic zones of the USSR. (Tekhniko-ekonomicheskaja otsenka metodov zimnego betonirovania v razlichnykh klimaticheskikh zonakh Sovetskogo Soiuza), Sovalov, I.G., International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Stroizdat, 1975, p.401-403, In Russian. English summary p.464. DLC TA682.43.157

Winter concreting, Economic analysis, Climatic factors.

33-2064

Theory and practice of building stone and large-panel structures in the USSR, in freezing weather without heating. (Teoriia i praktika zimnego stroitel'stva kamennykh i krupnopanel'nykh zdaniy v SSSR bez progrevaj), Shishkin, A.A., International symposium on winter concreting, 2nd, Moscow, Oct. 14-16, 1975. Proceedings, Vol.2, Moscow, Stroizdat, 1975, p.404-413, In Russian. English summary p.464. 6 refs. DLC TA682.43.157

Cold weather construction, Masonry, Prefabrication, Large panel buildings, Joints (junctions), Grouting, Mortars, Cements, Cement additives, Antifreezes.

33-2065

Sulfate content in the antarctic ice cap. Vilenskii, V.D., et al, U.S. Army Foreign Science and Technology Center. Translation, July 1977, FSTC-430-77, 15p., ADB 025-550, For Russian original, see F-14003 or 29-892. 19 refs. Koroleva, N.I.

Ice sheets, Ice composition, Snow composition, Sulfate.

Sulfate concentration in ice can be determined by turbidimetry or titrimetry in comparison with concentration by evaporation. Sulfate concentration in the snow of antarctic littoral regions varies within wide limits with no seasonal character. Sulfate concentration decreases with distance from the coast. It is assumed that sulfate is deposited primarily by dry precipitation.

33-2066

Large-scale numerical model of sea ice. Parkinson, C.L., et al, Journal of geophysical research, Jan. 20, 1979, 84(C1), p.311-337, Refs. p.335-337. Washington, W.M.

Sea ice distribution, Ice cover thickness, Ice models, Snow cover, Ice resistivity, Water temperature, Meteorological factors.

Work at the National Center for Atmospheric Research has resulted in the construction of a large-scale sea ice model capable of coupling with atmospheric and oceanic models of comparable resolution. The sea ice model itself simulates the yearly cycle of ice in both the northern and the southern hemispheres. Horizontally, the resolution is approx 200 km, while vertically the model includes four layers, ice, snow, ocean, and atmosphere. Both thermodynamic and dynamic processes are incorporated, the thermodynamics being based on energy balances at the various interfaces and the dynamics being based on the following five stresses: wind stress, water stress, Coriolis force, internal ice resistance, and the stress from the tilt of the sea surface. Although the ice within a given grid square is of uniform thickness, each square also has a variable percentage of its area assumed ice free. The model results produce a reasonable yearly cycle of sea ice thickness and extent in both the Arctic and the Antarctic. In the Antarctic the ice expands from a minimum in Mar. to a maximum in late Aug., remaining close to the continent in the former month and extending northward of 60S in the latter month. Maximum thicknesses are about 1.4 m. The distribution of modeled ice concentrations correctly reveals a more compact ice cover in the northern hemisphere than in the southern hemisphere. (Auth. mod.)

- 33-2067**  
**Fifteenth Soviet Antarctic Expedition. Description and scientific results. Winter research 1969-1971.** (Piatnadsatsaia kontinental'naia ekspeditsiia. Opisaniie i nauchnye rezul'taty. Zimovochnye issledovaniia 1969-1971 gg.). Sovetskaia antarkticheskaia ekspeditsiia, *Sovetskaia antarkticheskaia ekspeditsiia. Trudy*, 1977, Vol.64, 151p., In Russian with English table of contents. Numerous refs. *passim*.  
**Research projects, Antarctica.**  
This report on the activities of the 15th SAE is divided into two sections. The first, entitled "General description", includes discussions of the following phases of the winter season's work: organization of expedition activities, activities of the logistics group, construction and repair work, and organization and techniques of scientific activities, by discipline. The second section presents papers on scientific results. For individual papers, see A-21140, H-21141 through H-21146, F-21138, I-21139, K-21136, K-21137, and L-21135, or 33-2068 and 33-2069.
- 33-2068**  
**Short-wave radiation attenuation by snow cover, ice and water investigated on the basis of data gathered in the Mirnyy area.** (Oslablenie korotkovolnovoi radiatsii snezhnoi tolshchey, l'dom i vodoi po dannym nabliudenii v raione observatorii Mirnyy). Adamenko, V.N., *Sovetskaia antarkticheskaia ekspeditsiia. Trudy*, 1977, Vol.64, p.64-71, In Russian. 12 refs.  
**Attenuation, Radiation, Ice physics, Ice optics, Snow optics, Snow physics, Sea water, Light transmission, Antarctica—Mirnyy Station.**  
Results of studying short-wave radiation penetration into snow, ice and water using highly sensitive instruments are presented. Conditions of short-wave radiation attenuation in water with and without ice cover are compared. Changes in illumination up to 100-200 m are related to short-wave radiation attenuation. The basic characteristics of attenuation by water and ice of both light and short-wave radiation in pack ice of various thicknesses are identified. The problem of attenuation of light and short-wave radiation by snow cover on the continent between the 105th and 125th km along the Mirnyy-Vostok traverse route is also investigated.
- 33-2069**  
**Principal findings of glaciological and geomorphological research in the McMurdo Sound region (Victoria Land).** (Osnovnye rezul'taty gliatsiogeomorfologicheskikh issledovaniy v raione zaliva Mak-Merdo (Zemlia Viktorii)). Miagkov, S.M., *Sovetskaia antarkticheskaia ekspeditsiia. Trudy*, 1977, Vol.64, p.88-99, In Russian. 20 refs.  
**Glaciology, Research projects, Antarctica—McMurdo Sound.**  
The author participated in the 15th SAE as an exchange scientist at McMurdo. He briefly described the area and some improvements introduced in the scientific program. A summary of results is given; emphasis was placed on neotectonic variations in sea level during glacial times, on the basic stages of relief evolution and on the history of glaciation of the continental coast of McMurdo Sound (the Dry Valleys of Victoria Land) as it reflects tectonic movement.
- 33-2070**  
**Pipelines in adverse environments; a state of the art.** Vol.1.  
American Society of Civil Engineers Pipeline Division Specialty Conference, New Orleans, Louisiana, Jan. 15-17, 1978. Proceedings. Pipelines in adverse environments; a state of the art, Vol.1, New York, N.Y., American Society of Civil Engineers, 1979, 394p., Refs. *passim*. For selected papers see 33-2071 through 33-2080.  
**Pipelines, Cold weather construction, Subsurface structures, Permafrost structure, Permafrost thermal properties, Frost heave, Remote sensing, Design, Blasting.**
- 33-2071**  
**Arctic pipeline construction—an overview.**  
Huck, R.W., ASCE Pipeline Division Specialty Conference, New Orleans, Louisiana, Jan. 15-17, 1978. Proceedings. Pipelines in adverse environments; a state of the art, Vol.1, New York, N.Y., American Society of Civil Engineers, 1979, p.51-62.  
**Pipelines, Cold weather construction, Pipe laying, Environmental impact, Drilling, Ice (construction material), Snow (construction material), Ice conditions, Snow cover distribution, Construction costs, Design.**
- 33-2072**  
**Controlled trench blasting in frozen ground.**  
Oriard, L.L., et al, ASCE Pipeline Division Specialty Conference, New Orleans, Louisiana, Jan. 15-17, 1978. Proceedings. Pipelines in adverse environments; a state of the art, Vol.1, New York, N.Y., American Society of Civil Engineers, 1979, p.63-78, 18 refs.  
Tart, R.G., Jr.  
**Frozen ground physics, Permafrost structure, Blasting, Elastic waves, Explosion effects, Vibration, Trenching.**
- 33-2073**  
**Heat flow around pipes buried in cold ground.**  
Mohan, A., et al, ASCE Pipeline Division Specialty Conference, New Orleans, Louisiana, Jan. 15-17, 1978. Proceedings. Pipelines in adverse environments; a state of the art, Vol.1, New York, N.Y., American Society of Civil Engineers, 1979, p.79-102, 8 refs.  
Lovell, C.W.  
**Permafrost thermal properties, Subsurface structures, Heat transfer, Thermal analysis, Hot oil lines, Ground thawing, Thermal effects, Pipeline insulation.**
- 33-2074**  
**Geotechnical engineering applications to the chilled gas pipeline design.**  
Phukan, A., ASCE Pipeline Division Specialty Conference, New Orleans, Louisiana, Jan. 15-17, 1978. Proceedings. Pipelines in adverse environments; a state of the art, Vol.1, New York, N.Y., American Society of Civil Engineers, 1979, p.157-168.  
**Subsurface structures, Permafrost thermal properties, Gas pipelines, Cold weather construction, Geologic processes, Design, Engineering, Environmental impact.**
- 33-2075**  
**Reburial considerations for an exposed pipeline.**  
Hartig, E.P., et al, ASCE Pipeline Division Specialty Conference, New Orleans, Louisiana, Jan. 15-17, 1978. Proceedings. Pipelines in adverse environments; a state of the art, Vol.1, New York, N.Y., American Society of Civil Engineers, 1979, p.238-254, 10 refs.  
Nottingham, D., Swanson, J.E., Tisdale, B.C.  
**Subsurface structures, Hot oil lines, Trenching, Excavation, Cold weather construction, Ice loads, Floods, Structural analysis, Tides, United States—Alaska—Cook Inlet.**
- 33-2076**  
**Computer system to design vertical support members for Trans-Alaska pipeline.**  
Tart, R.G., Jr., et al, ASCE Pipeline Division Specialty Conference, New Orleans, Louisiana, Jan. 15-17, 1978. Proceedings. Pipelines in adverse environments; a state of the art, Vol.1, New York, N.Y., American Society of Civil Engineers, 1979, p.255-267, 3 refs.  
Ghuman, O.S.  
**Pipeline supports, Cold weather construction, Permafrost preservation, Permafrost thermal properties, Hot oil lines, Computer applications, Design.**
- 33-2077**  
**Remote detection of massive ice in permafrost along the Alyeska pipeline and the pump station feeder gas pipeline.**  
Kovacs, A., et al, MP 1175, ASCE Pipeline Division Specialty Conference, New Orleans, Louisiana, Jan. 15-17, 1978. Proceedings. Pipelines in adverse environments; a state of the art, Vol.1, New York, N.Y., American Society of Civil Engineers, 1979, p.268-279, 10 refs.  
Morey, R.M.  
**Permafrost structure, Permafrost physics, Ice detection, Subsurface investigations, Remote sensing, Radar echoes, Ground ice, Ice formation, Sounding, Reflectivity, Pipelines.**  
Field soundings using an impulse radar system were carried out during May 1976 along a section of the Alyeska Pipeline near Pump Station 3 and the pump station feeder gas pipeline trench near the Happy Valley Camp, Alaska. The radar system, operating on the ground, provided a continuous profile of the near-surface geological structure of the permafrost. A unique dual antenna configuration produced two profiles, a vertical profile and an offset profile, from which the velocity of the radar signal at any point along the traverse could be calculated and from which a representative depth scale for the subsurface profile was determined. The profile results proved useful in identifying regions of massive ice in the permafrost. Logs from holes drilled for the oil pipeline's Vertical Support Members are compared with the radar profile data. This comparison shows that the radar detected the top and bottom of massive ice to a depth of approximately 30 ft.
- 33-2078**  
**Chilled pipeline frost heave mitigation concepts.**  
Davison, B.E., et al, ASCE Pipeline Division Specialty Conference, New Orleans, Louisiana, Jan. 15-17, 1978. Proceedings. Pipelines in adverse environments; a state of the art, Vol.1, New York, N.Y., American Society of Civil Engineers, 1979, p.294-306, 8 refs.  
Nottingham, D., Rooney, J.W., Vita, C.L.  
**Frost heave, Countermeasures, Cold weather construction, Gas pipelines, Subsurface structures, Permafrost thermal properties, Permafrost preservation, Freeze thaw cycles, Frozen ground physics.**
- 33-2079**  
**Constructing a pipeline in northern Iran.**  
Stasny, F.J., ASCE Pipeline Division Specialty Conference, New Orleans, Louisiana, Jan. 15-17, 1978. Proceedings. Pipelines in adverse environments; a state of the art, Vol.1, New York, N.Y., American Society of Civil Engineers, 1979, p.343-348.  
**Pipelines, Cold weather construction, Seismology, Temperature variations.**
- 33-2080**  
**Prototype pile tests in permafrost soils.**  
Black, W.T., et al, ASCE Pipeline Division Specialty Conference, New Orleans, Louisiana, Jan. 15-17, 1978. Proceedings. Pipelines in adverse environments; a state of the art, Vol.1, New York, N.Y., American Society of Civil Engineers, 1979, p.372-383, 3 refs.  
Thomas, H.P.  
**Pile foundations, Pipeline supports, Permafrost thermal properties, Permafrost preservation, Frozen ground mechanics, Loads (forces), Design criteria, Tests.**
- 33-2081**  
**Heat transfer: research and application.**  
Chen, J.C., ed, *American Institute of Chemical Engineers. AICHE symposium series*, 1978, 74(174), 360p., Refs. *passim*. For selected papers see 33-2082 through 33-2087.  
National Heat Transfer Conference, 15th, San Francisco, Calif., Aug. 1975.  
**Permafrost heat transfer, Soil freezing, Heat flux, Thermal diffusivity, Ice refrigeration, Permafrost hydrology, Glacier flow, Heat transfer, Ice lenses.**
- 33-2082**  
**Natural circulation self-refrigerated pile for the direct support of buildings in permafrost regions.**  
Babb, A.L., et al, *American Institute of Chemical Engineers. AICHE symposium series*, 1978, 74(174), p.223-234, 12 refs.  
Godal, A., Wakefield, A.W., McKee, R.E., Strand, M.J.  
**Permafrost heat transfer, Pile foundations, Permafrost beneath structures, Permafrost preservation, Loads (forces), Frozen liquids, Static loads, Pile structures, Convection, Analysis (mathematics).**
- 33-2083**  
**Fundamentals of ice lens formation.**  
Takagi, S., *American Institute of Chemical Engineers. AICHE symposium series*, 1978, 74(174), MP 1173, p.235-242, 27 refs. See also 32-3470 and 32-4368.  
**Ice lenses, Ice formation, Soil moisture, Soil freezing, Heat transfer, Frost heave, Analysis (mathematics).**  
A new concept of the freezing of water, called segregation freezing, is proposed to explain the creation of the suction force that draws pore water up to the interface of a growing ice lens. The temperature of segregation freezing is shown to be lower than that of normal freezing (in situ freezing). This difference determines the pressure that the ice lens exerts while growing and carrying the overlying weight. On the assumption that the soil structure is rigid, equations governing the simultaneous flow of heat and water are formulated and solved for the limit of time  $t$  to 0 with the combination of analytical and numerical methods. Numerical computation of the solution yields a result that is reasonable, compared with experience in laboratory and nature.
- 33-2084**  
**Application of a finite-difference technique to thermal wave propagation.**  
Baumeister, K.J., *American Institute of Chemical Engineers. AICHE symposium series*, 1978, 74(174), p.243-249, 5 refs.  
**Heat flux, Thermal diffusivity, Soil physics, Ice cover effect, Snow cover effect, Wave propagation, Analysis (mathematics).**

- 33-2085  
Approximate solution to the moving boundary problem associated with the freezing and melting of lake ice.  
Foss, S.D., *American Institute of Chemical Engineers. AICRE symposium series*, 1978, 74(174), p.250-255, 17 refs.  
Lake ice, Boundary value problems, Ice air interface, Ice water interface, Ice temperature, Heat transfer, Freeze thaw cycles, Analysis (mathematics), Mathematical models.
- 33-2086  
Isua, Greenland: glacier freezing study.  
Ashton, G.D., *American Institute of Chemical Engineers. AICRE symposium series*, 1978, 74(174), MP 1174, p.256-264, 9 refs.  
Glacier flow, Creep rate, Ice refrigeration, Mining, Drilling, Analysis (mathematics), Ice temperature.  
A scheme for cooling the lower portion of the edge of the Greenland ice sheet, which abuts a potential mining operation is examined. At the mine site, the ore body is overlain with ice. Once the overburden is removed, however, the adjacent ice is expected to flow toward the pit. One possible means of slowing this movement is to cool the ice below its present temperature to achieve a reduction in the creep rate and a retardation of basal slip. The present study examines analytically the magnitude of cooling which may be accomplished by drilling a series of vertical holes about the periphery of the mine site. Refrigeration is accomplished by pumping a coolant downhole in a central pipe, then uphole in an annulus between the pipe and hole wall, and then through a thin walled pipe exposed to the cold surface climate above the ice sheet. Results of example calculations for various particular combinations of the free parameters are examined and include cooling requirements, hold spacing, pump requirements, and other parameters. Over a period of operation on the order of a year or more, it appears possible to cool a substantial part of the lower area of the glacier on the order of -1 to -2°C, using a hole spacing that is considered reasonable. The results of the study are to be used as input to a detailed glacier flow study.
- 33-2087  
Integral methods for the melting of permafrost by groundwater flow.  
Reid, R.L., *American Institute of Chemical Engineers. AICRE symposium series*, 1978, 74(174), p.265-270, 9 refs.  
Permafrost hydrology, Ground thawing, Ground water, Water flow, Permafrost heat transfer, Phase transformations, Conduction, Boundary layer, Analysis (mathematics).
- 33-2088  
Melioration of the Tuyuksu moraine lakes in the Malaya Almatinka River Basin. (K voprosu melioratsii ozer na morene Tuyuksu v basseine r. Malaia Almatinka).  
Golubovich, V.A., *Alma-Ata. Gidrometeorologicheskaya observatoriia. Sbornik rabot*, 1978, Vol.7, p.57-64, In Russian. 1 ref.  
Mountain glaciers, Moraines, Glacial lakes, Slope processes, Mudflows, Glacial hydrology.
- 33-2089  
Peculiarities of avalanche formation in the glacial zone of Zailiyskiy Alatau (Malaya Almatinka glaciers). (Osobennosti lavinooobrazovaniia v glatsial'noi zone Zailiyskogo Alatau (na primere Maloalmatinskikh lednikov)).  
Kondrashov, I.V., *Alma-Ata. Gidrometeorologicheskaya observatoriia. Sbornik rabot*, 1978, Vol.7, p.35-48, In Russian. 5 refs.  
Mountain glaciers, Snow cover distribution, Avalanche formation, Snow surveys.
- 33-2090  
Calculating snow reserves in the mountains of the Malaya Almatinka River Basin. (Raschet snegozapasaov v gorakh na primere basseina r. Malaia Almatinka).  
Rybikina, M.P., et al., *Alma-Ata. Gidrometeorologicheskaya observatoriia. Sbornik rabot*, 1978, Vol.7, p.27-34, In Russian. 4 refs.  
Shehegoleva, N.N.  
River basins, Snow cover distribution, Snow depth, Snow water equivalent, USSR—Malaya Almatinka River.
- 33-2091  
Airborne radar technique of measuring thickness of ice covers on rivers, lakes and reservoirs. (Primenenie radiolokatsionnogo metoda pri izmerenii tolshchiny ledianogo pokrova rek, ozer i vodokhranilishch, Chizhov, A.N., et al., *Leningrad. Gosudarstvennyi gidrologicheskii institut. Trudy*, 1977, Vol.245, p.3-29, In Russian. 11 refs.  
Glushnev, V.G., Slutsker, B.D., Borodulin, V.V.  
Icebound lakes, Icebound rivers, Ice cover thickness, Airborne radar, Radar echoes.
- 33-2092  
Airborne radar surveys in hydrologic investigations. (Radiolokatsionnaia aerost' emka i ee primenenie v gidrologicheskikh issledovaniakh).  
Usachev, V.F., et al., *Leningrad. Gosudarstvennyi gidrologicheskii institut. Trudy*, 1977, Vol.245, p.64-75, In Russian. 5 refs.  
Borodulin, V.V., Starostin, V.A.  
Airborne radar, Radar echoes, Radar photography, River ice, Lake ice, Ice conditions, Ice reporting, Snow cover distribution, Snowmelt.
- 33-2093  
Distinguishing areas of different submergence in the Ob' River flood plain. (Isopol'zovanie materialov radiolokatsionnoi s'emki dlia vydeleniia uchastkov razlichnoi zatoplaiemosti v polme r. Obi).  
Borodulin, V.V., et al., *Leningrad. Gosudarstvennyi gidrologicheskii institut. Trudy*, 1977, Vol.245, p.76-85, In Russian. 5 refs.  
Korolev, V.M., Tereshenkov, O.M.  
Flood forecasting, Radar photography, Flood control, Geobotanical interpretation, Airborne radar, Surveys, USSR—Ob' River.
- 33-2094  
Snow and avalanches in the Swiss Alps, winter 1976-1977. (Schnee und Lawinen in den Schweizer Alpen, Winter 1976/77).  
Davos, Switzerland. Eidgenössisches Institut für Schnee- und Lawinenforschung, Its Winterberichte, No.41, 1978, 142p., In German. Refs. passim. For selected papers see 33-2095 through 33-2097.  
Snow surveys, Avalanches, Snow depth, Switzerland—Alps.
- 33-2095  
Snow and avalanches in the Davos area. (Schnee und Lawinen in der Region Davos).  
Föhn, P., et al., *Davos, Switzerland. Eidgenössisches Institut für Schnee- und Lawinenforschung. Winterberichte*, 1978, No.41, p.28-39, In German.  
Beck, E.  
Snow depth, Avalanche formation, Snow temperature, Snowfall, Switzerland—Davos.
- 33-2096  
Snow and avalanche conditions in the Swiss Alps. (Schnee- und Lawinenverhältnisse im schweizerischen Alpengebiet).  
Schild, M., et al., *Davos, Switzerland. Eidgenössisches Institut für Schnee- und Lawinenforschung. Winterberichte*, 1978, No.41, p.40-87, In German.  
Gliott, S.  
Snow surveys, Snow depth, Avalanche formation, Statistical data, Observation, Switzerland—Alps.
- 33-2097  
Accidents and damage caused by avalanches. (Durch Lawinen verursachte Unfälle und Schäden).  
Schild, M., et al., *Davos, Switzerland. Eidgenössisches Institut für Schnee- und Lawinenforschung. Winterberichte*, 1978, No.41, p.88-141, In German.  
Etter, H.J., Gliott, S.  
Avalanche formation, Damage, Snowfall, Snow depth, Switzerland—Alps.
- 33-2098  
Arctic geophysical review.  
Sweeney, J.F., ed., *Canada. Dept. of Energy, Mines and Resources. Earth Physics Branch. Publications*, 1978, 45(4), 108p., In English with French summary. Refs. passim.  
Geophysical surveys, Hydrography, Seismic surveys, Heat transfer, Bottom sediment, Tectonics.
- 33-2099  
Environmental planning for an Alaskan water-oriented recreational area.  
LaPerrriere, J.D., *Alaska. University. Institute of Water Resources. Report*, June 1978, IWR-90, 21p., 5 refs. Microfiche only.  
Limnology, Lakes, Biomass, Watersheds, Ecology, Environments, United States—Alaska—Tanana Lakes.
- 33-2100  
Geologic road log Alyeska haul road, Alaska, June-August, 1975.  
Hamilton, T.D., *U.S. Geological Survey Open-file report*, No.79-227, 64p. + 4 maps.  
Roads, Cold weather construction, Seasonal freeze thaw, Permafrost structure, Permafrost hydrology, Active layer, Mudflows, Drainage, Slope processes, United States—Alaska.
- 33-2101  
PENNDOT portion of research on the project fundamentals of frost action in subgrade soils.  
Cumberland, G., et al., *Pennsylvania. Department of Transportation. Technical research report*, Oct. 1976, PDT-68-13, 77p. PB-266 125.  
Hoffman, G.L.  
Subgrade soils, Frost resistance, Frost action, Measuring instruments.
- 33-2102  
Preliminary radio performance predictions for the Arctic Environmental Buoy (AEB).  
Buck, B.M., *Polar Research Laboratory, Inc., Santa Barbara, Calif. Technical report*, June 1976, PRL-TR-5, 31p. ADA-026 552.  
Drift stations, Remote sensing, Data transmission, Telemetry equipment, Pack ice.
- 33-2103  
Research on the dynamics of the Arctic tundra ecosystem. Progress report, 1 July 1975-30 June 1976.  
Miller, P.C., *San Diego State University, Calif.*, 1976, 388p. SAN-807X6.  
Tundra vegetation, Biomass, Soil chemistry, Nutrient cycle, Ecosystems, Mathematical models.
- 33-2104  
Engineering summary of powerplant icing. Technical data.  
Pfeifer, G.D., et al., *Pratt Whitney Aircraft Group, East Hartford, Conn. Report*, July 1977, PWA-5522, 203p. ADA-045 087.  
Maier, G.P.  
Aircraft icing, Engines, Ice prevention.
- 33-2105  
Flexible layered pavement design procedure for Rhode Island.  
Nacci, V.A., et al., *Rhode Island. University. Division of Engineering Research and Development. Report*, May 1977, URI-9804-5042, 52p. PB-272 238.  
Moulthrop, K., Wang, M.-C., Huston, M.T.  
Pavements, Cold weather construction, Bituminous concretes, Concrete strength, Frost heave.
- 33-2106  
Effect of antecedent conditions on frozen ground floods.  
Pedersen, R., et al., *Idaho. University. Water Resources Research Institute. Report*, Jan. 1977, W77-10175, 32p. PB-270 632.  
Molnau, M., Yen, E.S.  
Runoff, Floods, Frozen ground, Analysis (mathematics).
- 33-2107  
Great Lakes Winter navigation. Technical and economic analyses.  
Michigan. University. Department of Naval Architecture and Marine Engineering, Ann Arbor, 1975, 6 vols. PB-270 982-SET.  
Ice navigation, Ships, Economic analysis, Computer programs, Great Lakes.  
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- 33-2108  
Study of potential ice fog and low temperature water fog occurrence at Mildred Lake, Alberta.  
Murray, W.A., et al., *Synchrude Canada, Ltd. Environmental research monograph*, 1976, No.4, 69p. NP-21651.  
Kurtz, J.  
Ice fog, Oil recovery, Environmental impact.
- 33-2109  
On the question of accumulation of ice meltwater south of the ice in the Chukchi Sea.  
Handlers, R.G., *U.S. Naval Postgraduate School. Report*, Mar. 1977, No. NPS-68PA77031, 48p. ADA-039 155.  
Sea ice, Meltwater, Water flow, Water chemistry, Salinity, Ocean currents.
- 33-2110  
Snow mapping and land use studies in Switzerland.  
Haefner, H., *U.S. National Aeronautics and Space Administration. Contractor report*, Jan. 1977, NASA-CR-152631, 55p. E77-10137.  
Snow cover distribution, Mapping, Spaceborne photography, Photointerpretation, Switzerland.

- 33-2111**  
Ottawa spray rig tests of an ice protection system applied to the UH-1H helicopter.  
Cotton, R.H., *U.S. Army Air Mobility Research and Development Laboratory. Technical report*, Nov. 1976, USAAMRDL-TR-76-32, 97p. ADA-034 458. Helicopters, Aircraft icing, Ice prevention, Electric heating.
- 33-2112**  
Polar sub-programme: Global Atmospheric Research Program, *World Meteorological Organization. Publication*, Mar. 1978, GARP-Publ-19, 63p. N79-11615. Research projects, Sea ice, Ice cover effect, Arctic climate.
- 33-2113**  
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Morin, P.  
Soil erosion, Wind erosion, Frost action, Seasonal variations, Frozen ground mechanics.
- 33-2114**  
State-of-art review of basic problems for a naval architect.  
Riska, K., et al., Espoo, Finland, Technical Research Centre, 1977, 74p. N79-11257.  
Varsta, P.  
Ice structure, Ice formation, Ships, Icebreakers, Ice mechanics, Models.
- 33-2115**  
Snow physics and avalanche prediction.  
Hartline, B.K., *Science*, Jan. 26, 1979, 203(4378), p.346-348.  
Avalanche mechanics, Avalanche forecasting.
- 33-2116**  
Churchill River diversion, Burntwood River waterway: studies to evaluate winter regime.  
Hopper, H.R., et al., *Canadian journal of civil engineering*, Dec. 1978, 5(4), p.586-594, in English with French summary. 5 refs.  
Simonsen, C.P.S., Poulter, W.J.S.  
River flow, Ice cover effect, Ice dams, Computer applications.
- 33-2117**  
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Adams, W.P., et al., *Water research*, 1979, 13(2), p.213-215, 9 refs.  
English, M.C., Lasenby, D.C.  
Snow composition, Minerals, Lake ice.
- 33-2118**  
Is the soil frozen or not—an algorithm using weather records.  
Cary, J.W., et al., *Water resources research*, Dec. 1978, 14(6), p.1117-1122, 13 refs.  
Campbell, G.S., Papendick, R.I.  
Frozen ground hydrology, Ground ice, Soil freezing, Ground thawing, Heat transfer.
- 33-2119**  
Snowplowable raised pavement markers in New Jersey.  
Jagannath, M.V., et al., *Transportation research record*, 1977, No.651, p.39-42.  
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- 33-2252**  
Norwegian and Barents Seas: oil for the 21st century.  
King, R.E., *World oil*, Dec. 1977, 185(7), p.69-76, 4 refs.  
Oil recovery, Offshore drilling, Geologic structures, Norwegian Sea, Barents Sea.
- 33-2253**  
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Cements, Cold weather performance, Compressive strength, Freeze thaw cycles, Frozen ground mechanics, Well casings.
- 33-2254**  
Logging, coring and testing for permafrost evaluation.  
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Permafrost physics, Permafrost thermal properties, Well logging, Drill core analysis, Unfrozen water content, Hydrates, Ground thawing.
- 33-2255**  
Designing casings and wellheads for Arctic service.  
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Well casings, Ground thawing, Permafrost preservation, Compressive strength, Strains, Steels.
- 33-2256**  
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Drilling, Equipment, Cold weather construction, Permafrost control.
- 33-2257**  
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- 33-2258  
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Permafrost, Extraterrestrial ice.
- 33-2259  
Cathodic protection of a hot pipeline in frozen earth.  
O'Connell, J.M., *Materials performance*, May 1977,  
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physics, Electrical resistivity, Electricity.
- 33-2260  
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rability, Salinity.
- 33-2261  
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Owens, E.H., *Canada. Fisheries Research Board  
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Environmental impact.
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Mills, A.L., Walker, J.D., Garcia-Tello, P., Campos-P.,  
V.  
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impact.
- 33-2263  
Prudhoe crude oil in Arctic marine ice, water, and  
sediment systems: Degradation and interactions with  
microbial and benthic communities.  
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French summary. 7 refs.  
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Oil spills, Sea ice, Sea water, Sediments, Environ-  
mental impact.
- 33-2264  
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port): Freezing of material systems containing aqua-  
solutions).  
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gineers. Bulletin*, Oct. 1978, 21(160), p.1507-1513, 5  
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- 33-2265  
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gineers. Bulletin*, Oct. 1978, 21(160), p.1514-1520,  
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- 33-2266  
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33-2266 through 33-2277.  
DLC GB1155.T49  
Permafrost hydrology, Ground ice, Subpermafrost  
ground water, Chemical composition, Supraperma-  
frost ground water, Moisture transfer, Active layer,  
Water pollution, Environmental protection.
- 33-2267  
Physico-chemical processes originating during ice  
melting and their role in the formation of chemical  
composition of ground and surface mineral waters.  
(Fiziko-khimicheskie protsessy pri obrazovanii i taianii  
l'da i ikh rol' v formirovanii khimicheskogo sostava  
podzemnykh i poverkhnostnykh mineral'nykh vod),  
Vlasov, N.A., et al, Soveshchanie po podzemnym  
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sian.  
Ivanov, A.V., Gol'dapel', A.I.A., Sinitsyna, N.G.  
DLC GB1155.T49  
Lake ice, Water chemistry, Surface drainage, Ice  
composition, Ice melting, Ground water, Surface wa-  
ters.
- 33-2268  
Water exchange between ground waters and the sea-  
sonally frozen layer of the aeration zone in the Iv-  
ginsk intermontane basin of western Transbaikalia.  
(Vodooobmen mezhdu gruntovymi vodami i sezonno-  
merzlym sloem zony aeratsii v Ivoiginskoi mezhgornoi  
vpadine Zapadnogo Zabaykalia),  
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East, 7th, Abstracts), Irkutsk, 1973, p.70-71, In Rus-  
sian.  
DLC GB1155.T49  
Frozen ground, Seasonal freeze thaw, Ground water,  
Moisture transfer, Frost penetration, Soil moisture  
migration, Snow cover effect.
- 33-2269  
Mineral waters in the Poloussny-Tuostakh and Kular  
water-bearing permafrost strata. (O mineral'nykh vo-  
dakh Poloussnensko-Tuostakhskogo i Kularskogo kri-  
ogennykh gidrogeologicheskikh massivov),  
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East, 7th, Abstracts), Irkutsk, 1973, p.77-78, In Rus-  
sian.  
Romanovskii, N.N., Buldovich, S.N.  
DLC GB1155.T49  
Permafrost hydrology, Springs (water), Water chem-  
istry, Taliks, Subpermafrost ground water, Water  
supply.
- 33-2270  
Formation of mineral waters on Arctic islands. (For-  
mirovanie mineral'nykh vod na ostrovakh Arktiki),  
Neizvestnov, I.A.V., Soveshchanie po podzemnym  
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sian.  
DLC GB1155.T49  
Permafrost hydrology, Brines, Subpermafrost ground  
water, USSR—Franz Josef Land.
- 33-2271  
Evaluation of water inflow into quarries in permafrost  
areas. (K voprosu otsenki vodopritokov v otkrytye  
gornye vyrabotki v usloviakh merzloj zony),  
Efimova, D.V., Soveshchanie po podzemnym vodam  
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DLC GB1155.T49  
Mining, Permafrost hydrology, Quarries, Water flow,  
Subpermafrost ground water, Active layer.
- 33-2272  
Hydrogeology of deeply buried placer deposits in the  
northeastern USSR. (Gidrogeologiya glubokozaalegai-  
ushchikh rossypnykh mestorozhdenii v usloviakh  
Severo-Vostoka SSSR),  
Kalmykov, P.N., et al, Soveshchanie po podzemnym  
vodam Sibiri i Dal'nego Vostoka, 7th, Tezisy dokladov  
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East, 7th, Abstracts), Irkutsk, 1973, p.111-113, In  
Russian.  
Ageenkov, A.V., Motrich, L.T.  
DLC GB1155.T49  
Placer mining, Permafrost hydrology, Water table,  
Taliks, Subpermafrost ground water.
- 33-2273  
Protection of ground water in the permafrost zone of  
Siberia in the system of environmental protection  
measures. (Okhrana podzemnykh vod territorii mer-  
zloj zony Sibiri v sisteme meropriyatii po okhrane  
okruzhaiushchei sredy),  
Tolstikhin, O.N., et al, Soveshchanie po podzemnym  
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East, 7th, Abstracts), Irkutsk, 1973, p.118-119, In  
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Klimochkin, V.V.  
DLC GB1155.T49  
Permafrost hydrology, Water pollution, Environmen-  
tal protection.
- 33-2274  
Forecasting ground water regime in permafrost areas  
using multiple correlation analysis. (Vozmozhnosti  
primeneniia metoda mnozhestvennoi korreliatsii dlia  
prognozirovaniia rezhima podzemnykh vod v us-  
loviakh rasprostraneniia mnogoletnemerzlykh porod),  
Ustinova, Z.G., Soveshchanie po podzemnym vodam  
Sibiri i Dal'nego Vostoka, 7th, Tezisy dokladov (Con-  
ference on ground water in Siberia and the Far East,  
7th, Abstracts), Irkutsk, 1973, p.121, In Russian.  
DLC GB1155.T49  
Permafrost hydrology, Water supply, Wells, Water  
level, Forecasting.
- 33-2275  
Dynamics and characteristics of the interrelationship  
between surface and ground water in permafrost  
areas. (Kharakternye osobennosti i dinamika vzaimos-  
vizi poverkhnostnykh i podzemnykh vod v zone  
mноголетnei merzloty),  
Furman, M.Sh., Soveshchanie po podzemnym vodam  
Sibiri i Dal'nego Vostoka, 7th, Tezisy dokladov (Con-  
ference on ground water in Siberia and the Far East,  
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DLC GB1155.T49  
Permafrost hydrology, Surface waters, Ground water,  
Soil moisture migration, Suprapermafrost ground wa-  
ter, Water transport, Subpermafrost ground water.
- 33-2276  
Electric heating of wells as a method of pollution  
prevention and conservation of subpermafrost ar-  
tesian waters. (Elektroobogrev skvazhin—odin iz me-  
todov bor'by s istozhcheniem i zagriazneniem podmer-  
zlotnykh artzijskikh vod),  
Gubanov, A.A., et al, Soveshchanie po podzemnym  
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Gubanov, B.A.  
DLC GB1155.T49  
Permafrost hydrology, Artesian water, Subperma-  
frost ground water, Water pollution, Environmental  
protection.
- 33-2277  
Experimental results of creating artificial water stor-  
age in taliks beneath Central Yakutian lakes. (Rezul-  
taty opytnykh rabot po sozdaniu iskusstvennykh  
zapasov podzemnykh vod v podozernykh talikakh  
Tsentral'noi Yakutii),  
Parshin, A.P., Soveshchanie po podzemnym vodam  
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ference on ground water in Siberia and the Far East,  
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Water supply, Taliks, Water storage, Permafrost hy-  
drology.
- 33-2278  
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No.28, 213p., Refs. passim. For selected papers see  
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Kenny, S.T., ed.  
Revegetation, Alpine vegetation, Plant ecology,  
Slope stability, Grasses, Plants (botany).
- 33-2279  
Aspects of the ecology of alpine and subalpine plants.  
Billings, W.D., *Colorado. State University, Fort Col-  
lins. Environmental Resources Center. Information  
series*, May 1978, No.28, p.1-16, 21 refs. Includes  
discussion.  
Alpine vegetation, Plant ecology, Environmental im-  
pact, Ecosystems, Revegetation.

33-2280

Problems in the identification of threatened and endangered plant species.

Buckner, D.L., *Colorado. State University, Fort Collins. Environmental Resources Center. Information series*, May 1978, No.28, p.17-24, 5 refs. Includes discussion.

Alpine vegetation, Protection, Environmental impact, Plants (botany), Ecosystems.

33-2281

Use of the Plant Information Network (PIN) in high altitude revegetation.

Dittberner, P.L., et al, *Colorado. State University, Fort Collins. Environmental Resources Center. Information series*, May 1978, No.28, p.52-74, 5 refs. Includes discussion.

Bryant, G.

Revegetation, Alpine vegetation, Computer applications, Classifications.

33-2282

Grass and legume improvement for high altitude regions.

Kenny, S.T., et al, *Colorado. State University, Fort Collins. Environmental Resources Center. Information series*, May 1978, No.28, p.84-100, 4 refs. Includes discussion.

Cuany, R.L.

Revegetation, Alpine vegetation, Growth, Plants (botany), Grasses.

33-2283

Development of plant materials for revegetation in Alaska.

Mitchell, W.W., *Colorado. State University, Fort Collins. Environmental Resources Center. Information series*, May 1978, No.28, p.101-115, 27 refs. Includes discussion.

Revegetation, Tundra vegetation, Grasses, United States—Alaska.

33-2284

Hazard identification, chemical removal and revegetation of a toxic chemical spill on Lawson Hill, San Miguel County.

Groeneveld, D.P., et al, *Colorado. State University, Fort Collins. Environmental Resources Center. Information series*, May 1978, No.28, p.142-153.

O'Boyle, P.S.

Revegetation, Plant ecology, Chemistry, Soil pollution, Glacial till, Slope processes.

33-2285

Steep slope design and revegetation techniques.

Erammer, R.L., *Colorado. State University, Fort Collins. Environmental Resources Center. Information series*, May 1978, No.28, p.162-167, Includes discussion.

Slope processes, Revegetation, Slope stability, Grasses, Design.

33-2286

Radar anisotropy of sea ice due to preferred azimuthal orientation of horizontal c axes of ice crystals.

Kovacs, A., et al, *Journal of geophysical research*, Dec. 20, 1978, 83(C12), MP 1139, p.6037-6046, 36 refs.

Morey, R.M.

Sea ice, Radar echoes, Anisotropy, Ice crystal structure, Electromagnetic properties, Ocean currents.

Results of impulse radar, ice crystal c axis, and subice current measurements on the fast ice near Narwhal Island, Alaska, are presented. The crystal structure of the ice was found to have a horizontal crystal c axis with a preferred azimuthal orientation. This orientation was found to align with the direction of the current at the ice-water interface. Impulse radar reflection measurements revealed that the preferred orientation of the sea ice crystal structure behaved as a microwave polarizer. It was observed that when the antenna E field was oriented parallel with the c axis of the crystal platelets, a strong reflection of the radar signal from the bottom of the ice was obtained. However, when the antenna E field was oriented perpendicular to the c axis, no bottom reflection was detected. The results of this study fully support earlier reports of sea ice inhomogeneity and anisotropy in reference to both structure and electromagnetic energy transmission.

33-2287

Oxygen isotope investigation of the origin of the basal zone of the Matanuska Glacier, Alaska.

Lawson, D.E., et al, *Journal of geology*, 1978, Vol.86, MP 1177, p.673-685, 34 refs.

Kulla, J.B.

Glacier ice, Ice structure, Oxygen isotopes, Thermodynamic properties.

An analysis of the oxygen isotope content of ice of the englacial and basal zones of the Matanuska Glacier at its terminus reveals the origin of the ice and entrained debris. The decrease with depth in the change of O18 values of ice of the diffused facies of the englacial zone and the dispersed facies of the basal zone is consistent with previous studies and indicates this ice originates in the accumulation area. Characteristics of the ice and debris of the dispersed facies indicate a subglacial source for

most of the debris. The sharp increase of more than 4 per mill in the change of O18 values of ice of the lower, stratified facies of the basal zone and its young radiocarbon age indicate this facies formed by subglacial freezing of isotopically enriched meltwater, probably surface-derived, to the glacier sole. The bubble-poor, fine-grained ice, thickness, stratification, rounded pebbles, and undisturbed sedimentary structures in this facies support this conclusion. The location, extent, and rates of subglacial ice formation and sediment entrainment vary. The Matanuska Glacier is therefore thermally complex, with zones of ice at the glacier sole that are at or below the pressure-melting point.

33-2288

River ice.

Ashton, G.D., *American scientist*, Jan./Feb. 1979, 67(1), MP 1178, p.38-45, 21 refs.

River ice, Ice formation, Ice jams, Ice growth, Thermal pollution, Temperature effects.

33-2289

Low friction hull coatings for icebreakers. Phase II, Parts I and II. Laboratory and field tests.

Calabrese, S.J., et al, *U.S. Coast Guard. Technical report*, Feb. 1976, USCG-D-32-76, 90p., ADA-024 847, For Phase I, Parts I and II, see 29-1654; for Phase II, Part III, see 33-359; for Phase III, see 33-2291.

Peterson, M.B., Ling, F.F.

Ships, Icebreakers, Protective coatings, Metal ice friction.

33-2290

Water level measurement from a floating ice cover.

Serson, H., et al, *Canada. Defence Research Establishment Pacific, Victoria. Technical memorandum*, Dec. 1977, DREP-TM-77-17, 23p. ADA-056 833.

Finlayson, D.

Water level, Floating ice, Measuring instruments, Tides.

33-2291

Low friction hull coatings for icebreakers. Phase III technical report.

Calabrese, S.J., et al, *U.S. Coast Guard. Technical report*, Oct. 1978, USCG-D-69-78, 192p., ADA-061 691, For Phase I, Parts I and II, see 29-1654; for Phase II, Parts I and II, see 33-2289; for Phase II, Part III, see 33-359.

Ling, F.F.

Ships, Icebreakers, Protective coatings, Metal ice friction.

33-2292

Collection of codes prescribed for the design and construction of plants, buildings and structures in the northern construction-climatic zone, permafrost and subzero temperatures (Extracts from the All-Union Building Code Documents). (Sbornik normativnykh trebovaniy po proektirovaniyu i stroitel'stvu predpriyatii, zdaniy i sooruzheniy v usloviyakh severnoy stroitel'no-klimaticheskoy zony, vechnomerzlykh gruntov i otritsatel'nykh temperatur (izvlecheniya trebovaniy iz obshchegosoyuznykh normativnykh dokumentov)).

Russia. Gosudarstvennyy komitet po delam stroitel'stva, Moscow, 1978, 153p., In Russian.

Building codes, Standards, Houses, Residential buildings, Industrial buildings, Roads, Railroads, Airports, Electric power plants, Concrete structures, Steel structures, Masonry, Water supply, Pipelines, Sewage, Heating.

33-2293

Climatic change.

Gribbin, J., ed, London, Cambridge University Press, 1978, 280p., Refs. For selected papers see 33-2294 through 33-2298 or F-21190, I-21187 through I-21189, and I-21191.

Climatic changes, Ice sheets, Snow cover, Sea ice, Heat balance, Isotope analysis, Glaciation.

This volume contains fourteen contributions on the subject of climatic change, arranged under the following headings: studying the climates of the past, balancing the global heat budget, astronomical influences, modelling the changing climate, and climate and man. A paper by H. Flohn (1974; 30-2570 or I-16225), providing an overall model of the initiation of a glaciation, is contained in an appendix.

33-2294

Geological-geophysical framework of ice ages.

Tarling, D.H., Climatic change, edited by J. Gribbin, London, Cambridge University Press, 1978, p.3-24, Refs. p.20-25.

DLC QC981.8.C5C55

Ice age theory, Climatic changes, Glaciation, Ice sheets, Paleoclimatology.

This discussion identifies some of the characteristics of previous ice ages and evaluates the significance of various geological and geophysical factors that have influenced past climatic changes and may be responsible for current change. With the arguable exception of the Late Precambrian Ice Age(s), the most notable feature of all ice ages is that they only occur at high latitudes, mostly within 30 deg of the pole. Throughout the Mesozoic, the South Pole was close to Antarctica, but it was only after it

became located inland that ice sheet formation commenced. The drift of the Gondwanan continent to the situation where the pole, by Middle Permian times, was merely on the edge of the land mass seems to coincide with the rapid, simultaneous disappearance of ice sheets throughout the Gondwanan continent, leaving only isolated mountain glaciers until the continent drifted sufficiently far back under the pole in Miocene times. It seems, therefore, that it is essential for the pole to lie well within a continental block before ice sheets can form, with shallow, epicontinental seas sufficiently near to provide a moisture supply.

33-2295

Isotope studies.

Duplessy, J.C., Climatic change, edited by J. Gribbin, London, Cambridge University Press, 1978, p.46-67, 122 refs.

DLC QC981.8.C5C55

Climatology, Ice sheets, Ice cores, Isotope analysis.

The application of oxygen isotopic analysis in benthic and pelagic foraminifera in deep sea cores is examined, with particular attention given to the factor controlling the isotopic composition of a given foraminifera specimen and to the assessment of which of these factors are likely to have changed in the past. The O-18 content of sea water is directly related to the extent of the continental ice volume; the larger the ice sheets formed on the continent, the heavier the isotopic composition of the sea water. The isotopic compositions of ice cores from Camp Century, Byrd Station, and the Vostok borehole, are examined. An upper limit of delta = -30 per mill has been estimated for the mean isotopic composition of continental excess ice during the latest glacial maximum. The isotopic balance between sea water and continental ice demonstrates that the increase of the mean O-18/O-16 of ocean water during the last glacial period was at least 1.2 per mill, in line with the benthic foraminifera and ice cap evidence.

33-2296

Heat balance of the Earth.

Budyko, M.I., Climatic changes, edited by J. Gribbin, London, Cambridge University Press, 1978, p.85-113, 48 refs.

DLC QC981.8.C5C55

Ice cover effect, Snow cover effect, Albedo, Heat balance.

This paper treats the heat balance of the Earth's surface, the Earth-atmosphere system and the atmosphere, as well as the water balance of the Earth. The effects of arctic and antarctic snow and ice cover on the albedo to the Earth's surface and the Earth-atmosphere system are taken into account.

33-2297

Recent changes in snow and ice.

Kukla, G.J., Climatic change, edited by J. Gribbin, London, Cambridge University Press, 1978, p.114-129, 36 refs.

DLC QC981.8.C5C55

Snow cover, Ice conditions, Pack ice, Sea ice, Ice sheets, Insolation, Climatic changes.

Observations on the sensitivity of snow and ice fields in both hemispheres to the seasonal march of insolation are summarized. In the southern hemisphere, the extent of the antarctic pack-ice fields is especially sensitive to insolation in early Nov. Higher insolation to pack-ice fields at this time should result in shorter ice seasons and a smaller average extent of the pack. Minimum global extent of snow and ice and minimum radiation losses over snow and ice areas are reached in Aug. and Sep.

33-2298

Global influences of mankind on the climate.

Kellogg, W.W., Climatic change, edited by J. Gribbin, London, Cambridge University Press, 1978, p.205-227, Refs. p.223-227.

DLC QC981.8.C5C55

Ice conditions, Sea ice, Pack ice, Climate, Heat balance, Surface temperature, Human factors.

Studies of the global influences of mankind on climate lead to the conclusion that barring a major natural perturbation to the climate, mankind's activities will in all likelihood warm the Earth in the next few decades. It is expected that the rate will be appreciably larger than any change of mean surface temperature seen in the past 100 yr. The greatest changes will probably take place in the polar regions. Four regimes of arctic and antarctic ice and snow are considered: winter snow cover on the land that melts in summer; floating sea ice or pack ice; mountain glaciers; and the ice sheets of Greenland and the Antarctic. It is considered unlikely that the polar ice masses will be greatly affected by anthropogenic warming in the next century or so.

33-2299

Geographic based information management system for permafrost prediction in the Beaufort and Chukchi Seas. Part I: Submarine permafrost on the Alaskan Shelf. Part II: Submarine permafrost and the development of the Arctic Shelf of Eurasia in Pleistocene. Part III: Atlas of the computerized maps of the Alaskan Shelf.

Vigdorichik, M., Boulder, Colorado, Environmental Research Laboratories, 1978, 3 vols., Bibliography p.134-141.

Data processing, Computer applications, Permafrost forecasting, Submarine permafrost, Permafrost structure, Mapping, Petroleum industry, Permafrost distribution, Permafrost depth.

33-2300

Movement of snow-water through small plant-soil systems in the Medicine Bow Mountains, Wyoming. Knight, D.H., et al, *Wyoming University Water Resources Research Institute. Report*, Apr. 1976, W77-01812, 71p. PB-261 252.

Harrison, A.T.

Snowmelt, Snow hydrology, Hydrologic cycle, Alpine vegetation, Evapotranspiration.

33-2301

Airborne linear-sweep FM radar system for measuring ice thickness.

Venier, G.O., et al, *Canada. Communications Research Centre. Report*, Dec. 1975, CRC-1269, 32p. N76-31379.

Cross, F.R.

Airborne equipment, Radar echoes, Ice cover thickness.

33-2302

L-band radar clutter statistics for terrain and ice. Volume 1. Technical discussion and results. Volume 2. Appendices.

Maffett, A., et al, *Environmental Research Institute of Michigan. Report*, Feb. 1978, ERIM-128900-9-F1 (1) (2), 2 vols., ADB-028 457L, ADB-028 458L, Distribution limited to U.S. Government agencies only. Klimach, H., Liskow, A., Rawson, R., Heimiller, R.C. Radar echoes, Terrain analysis, Pack ice, Tundra terrain, Statistical data.

33-2303

Ice-shedding paste for application to helicopter rotor blades.

Sewell, J.H., *United Kingdom. Royal Aircraft Establishment, Farnborough. Technical report*, Nov. 1977, RAE-TR-77173, 26p., ADB-028 285, Distribution limited to DDC users.

Ice prevention, Protective coatings, Helicopters.

33-2304

Icephobic coatings for army rotary-wing aircraft. Artis, D.R., Jr., *U.S. Army Air Mobility Research and Development Laboratory. Technical report*, May 1975, USAAMRDL-TN-19, 10p. ADB-004 715.

Ice prevention, Helicopters, Protective coatings, Chemical ice prevention.

33-2305

Selection of battery power supplies for cold temperature applications.

Winsor, W.D., et al, *Memorial University of Newfoundland. Centre for Cold Ocean Resources Engineering. CORE publication*, Sep. 1978, No.78-13, 22p.

Butt, K.A.

Low temperature tests, Electric power generation.

33-2306

Field guide for portland cement concrete construction in Antarctica.

Keeton, J.R., *U.S. Naval Construction Battalion Center, Port Hueneme, Calif. Civil Engineering Laboratory. Technical note*, Oct. 1969, NCEL-TN-1060, 18p., AD-861 520, 3 refs.

Cements, Concretes, Construction materials, Cold weather construction.

The guide was prepared for field use by military crews in producing, placing and curing portland cement concrete in Antarctica under summer temperatures down to 15F. Since the principal factors are mix control and mix temperature during production and exposed surface temperature control for 3 days following placement, these steps are discussed in considerable detail. The technical information presented in this document is based on field experiments at McMurdo Station, during Deep Freeze 69. (Auth. mod.)

33-2307

Icebreaker propulsion systems feasibility study. Vol.7. Mission sensitivity analyses.

NUS Corporation, Rockville, Md., Its report No.323, Feb. 1967, 51p. AD-861 585.

Icebreakers, Engines, Cost analysis.

The feasibility of polar icebreaker propulsion systems is studied. A ship with the characteristics of the reference design can accomplish approx 50% of individual antarctic scientific missions in the continuing mode, and 100% in the ramming mode. The results of the analysis appear to amply reinforce the validity of prior conclusions as to the superior cost effectiveness of nuclear propulsion systems for proposed polar icebreakers.

33-2308

New information on protective spruce strips. (Novoe o elovykh zaschitnykh zhivykh izgorodiakh, Chirkov, V.A., *Moscow. Vsesoiuznyi nauchno-issledovatel'skii institut zheleznodorozhnogo transporta. Vestnik*, 1978, No.7, p.47-52, In Russian. 7 refs.

Railroad tracks, Snowdrifts, Protective vegetation, Forest strips.

33-2309

Low temperature testing assembly based on IMASH-5S-65. (Ustanovka dlia nizkotemperaturnykh ispytaniy na baze IMASH-5S-65).

Demchuk, I.S., et al, *Zavodskaya laboratoria*, 1978, No.11, p.1371-1372, In Russian.

Baru, E.N., Krakhmalev, V.I.

Low temperature tests, Test equipment, Metals.

33-2310

Winterizing aircraft, a complicated problem. (Podgotovka aviatsionnoi tekhniki k zimnei ekspluatatsii— zadacha kompleksnaya).

Kovalev, P., *Vestnik protivovozdushnoi oborony*, 1978, No.9, p.70-73, In Russian.

Military transportation, Airplanes, Winter maintenance, Aircraft icing, Cold weather operation, Cold weather performance.

33-2311

Variations in the tidal regime due to hydraulic construction in border seas. (Izmeneniya rezhima prilivov v svyazi s gidrotekhnicheskimi stroitel'stvom v okrainykh moriakh).

Sezeman, N.A., *Vodnye resursy*, 1967, No.3, p.185-192, In Russian. 11 refs.

Hydroelectric power generation, Electric power plants, Tides, Tidal power plants, Okhotsk Sea.

33-2312

Experience in using pyramidal piles. (Opyt primeniya piramidal'nykh svay).

Labazin, A.D., et al, *Zhishishchnoe stroitel'stvo*, Oct. 1978, No.10, p.23-25, In Russian.

Bazdyrev, I.U.I., Dogadillo, A.I. Pile foundations, Prefabrication, Concrete piles, Reinforced concrete, Clay soils, Peat.

33-2313

Structural peculiarities of residential buildings designed for Noril'sk. (Konstruktivnye osobennosti zhilykh zdaniy dlia stroitel'stva v Noril'ske).

Pikhovkin, V.A., et al, *Zhishishchnoe stroitel'stvo*, Sep. 1978, No.9, p.4-6, In Russian.

Shkharov, N.D.

Residential buildings, Permafrost beneath structures, Design, USSR—Noril'sk.

33-2314

Assembled plates of increased frost resistance. (Sbornye plity povyshennoi morozostoikosti, Leshchinskii, M., *Stroitel'nye materialy i konstruksii*, Oct-Dec. 1977, No.4, p.24-25, In Russian.

Prefabrication, Plates, Reinforced concrete, Pavements, Frost resistance.

33-2315

Thermoinsulative cellular concrete for light roof structures. (Teploizolatsionnyi iacheisty beton dlia oblegchennykh krovельnykh konstruksii).

Merkin, A.P., et al, *Stroitel'nye materialy*, Nov. 1978, No.11, p.14-15, In Russian.

Prefabrication, Construction materials, Cellular concretes, Roofs, Thermal insulation.

33-2316

High strength concrete on a super-plasticizer base. (Vysokoprochnyi beton na osnove superplastifikatorov).

Bazhenov, I.U.M., et al, *Stroitel'nye materialy*, Sep. 1978, No.9, p.18-19, In Russian. 4 refs.

Concrete structures, Reinforced concrete, Concrete hardening, Concrete strength, Frost resistance, Concrete admixtures, Cements, Low temperature tests, Freeze thaw cycles.

33-2317

Construction of short heat-treated earth piles. (Ustroitel'stvo korotkikh termogruntovykh svay).

Iurdanov, A.P., *Promyshlennoe stroitel'stvo*, Oct. 1978, No.10, p.33-35, In Russian.

Pile foundations, Frozen fines, Ground ice, Frost heave, Loess, Boreholes, Electric heating, Piles.

33-2318

Safety of ice navigation. (Bezopasnost' plavaniya vo l'dakh).

Enin, N., *Rechnoi transport*, 1978, No.10, p.54-55, In Russian.

Ice conditions, Ice navigation, Icebreakers, USSR—Volga River.

33-2319

Soviet glaciological research in 1977. (Sovetskie gliatologicheskie issledovaniya v 1977 godu).

Kotliakov, V.M., et al, *Akademiya nauk SSSR. Institut geografii. Materialy gliatologicheskikh issledovaniy. Khronika obsuzhdeniya*, Jan. 1978, No.32, p.5-13, In Russian.

Lapina, I.I.A.

Glaciology, Research projects.

Activities and accomplishments of the Soviet antarctic research effort for 1977 are briefly reviewed. Taking part in the SAE for 1977 were the Moscow State University, the Arctic and Antarctic Institute and the Institute of Geography of the Academy of Sciences.

33-2320

Third meeting of the editorial board of the Atlas of World Snow and Ice Resources. (Tret'e zasedanie redkollegii atlasa snezhno-ledovykh resursov mira), Dreier, N.N., *Akademiya nauk SSSR. Institut geografii. Materialy gliatologicheskikh issledovaniy. Khronika obsuzhdeniya*, Jan. 1978, No.32, p.13-17, In Russian.

Ice surveys, Snow surveys, Maps, Research projects.

33-2321

First Siberian glacioclimatological lectures. (Pervye sibirskie gliatiosklimaticheskie chteniya).

Rotovaeva, O.V., et al, *Akademiya nauk SSSR. Institut geografii. Materialy gliatologicheskikh issledovaniy. Khronika obsuzhdeniya*, Jan. 1978, No.32, p.17-19, In Russian.

Chernova, L.P.

Glaciology, Climate, Tundra climate, Subarctic climate, USSR—Siberia.

33-2322

Estimating and large-scale mapping of water balance in mountain glacier basins. (Opyt rascheta i krupnomasshtabnogo kartirovaniya vodnogo balansa gor-nodnednikovyykh basseynov).

Sosedov, I.S., et al, *Akademiya nauk SSSR. Institut geografii. Materialy gliatologicheskikh issledovaniy. Khronika obsuzhdeniya*, Jan. 1978, No.32, p.21-26, In Russian with English summary.

Discussion p.76. 9 refs.

Filatova, L.N., Kikitenko, O.V.

Water balance, Mapping, Mountain glaciers, Analysis (mathematics), USSR—Zailiyskiy Alatau.

33-2323

Linear models for calculating glacial runoff. (Primenenie lineinykh modeley dlia rascheta stoka s lednikov).

Glazyrina, E.L., et al, *Akademiya nauk SSSR. Institut geografii. Materialy gliatologicheskikh issledovaniy. Khronika obsuzhdeniya*, Jan. 1978, No.32, p.27-34, In Russian with English summary.

Discussion p.76. 13 refs.

Glazyrin, G.E.

Mathematical models, Glacier melting, Runoff forecast, Subglacial drainage.

33-2324

Features of long-term runoff variations in relation to the water balance of glacier basins. (Osobennosti mnogoletnykh kolebaniy stoka v svyazi s izucheniem vodnogo balansa lednikovogo basseyna).

Mikhailova, V.I., et al, *Akademiya nauk SSSR. Institut geografii. Materialy gliatologicheskikh issledovaniy. Khronika obsuzhdeniya*, Jan. 1978, No.32, p.34-37, In Russian with English summary.

Discussion p.77. 3 refs.

Petriashova, E.V.

Water balance, Glacier melting, Runoff, Glacial hydrology.

33-2325

Meteorological conditions during ablation periods and glacier runoff on Severnaya Zemlya. (Meteorologicheskie usloviya perioda abliatsii i stok s lednikov Severnoi Zemli).

Briazgin, N.N., et al, *Akademiya nauk SSSR. Institut geografii. Materialy gliatologicheskikh issledovaniy. Khronika obsuzhdeniya*, Jan. 1978, No.32, p.37-43, In Russian with English summary.

Discussion p.77. 3 refs.

Mordvinov, A.A.

Glacier ablation, Runoff, Glacial hydrology, Meteorological factors, USSR—Severnaya Zemlya.

33-2326

Formation conditions and mechanism of water-snow flows. (Usloviya formirovaniya i mekhanizm vodos-nezhnykh potokov).

Laptev, M.N., et al, *Akademiya nauk SSSR. Institut geografii. Materialy gliatologicheskikh issledovaniy. Khronika obsuzhdeniya*, Jan. 1978, No.32, p.43-49, In Russian with English summary.

Discussion p.77-78. 8 refs.

Sapunov, V.N., Freidlin, V.S.

Slope processes, Snowmelt, Wet snow, Stream flow, Snow hydrology, Snow mechanics.

33-2327

Physical model for calculating the hazard of glacial mudflows in glacier-morainel complexes. (Fizicheskaya model' rascheta gliatsial'noi seleopasnosti lednikovo-morennogo kompleksa). Chistiaev, V.B., *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovani. Khronika obsuzhdeniia*, Jan. 1978, No.32, p.49-56, In Russian with English summary. Discussion p.78-79. 9 refs.

Glacial hydrology, Glacier ablation, Moraines, Slope processes, Mudflows, Forecasting.

33-2328

Engineering methods of glacial mudflow protection in Alma-Ata. (Opyt inzhenernykh metodov bor'by s gliatsial'nymi selami (na primere selezashchity Alma-Ata)). Niiarov, B.S., *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovani. Khronika obsuzhdeniia*, Jan. 1978, No.32, p.56-59, In Russian with English summary. 18 refs.

Slope processes, Snowmelt, Snow hydrology, Mudflows, Periglacial processes, Countermeasures, USSR—Alma Ata.

33-2329

Glacial lakes of Kirgizia and their role in mudflow formation. (Gliatsialnye ozero Kirgizii i ikh rol' v formirovani sel). Kubrushko, S.S., et al, *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovani. Khronika obsuzhdeniia*, Jan. 1978, No.32, p.59-62, In Russian with English summary. 2 refs.

Slope processes, Snowmelt, Mudflows, Snow hydrology, Glacial lakes, Glacial hydrology, Glacier ablation.

33-2330

Mass transfer intensity of glaciers as an indication of mudflow hazard. (Intensivnost' massoobmena lednikov kak pokazatel' seleopasnosti). Chernova, L.P., *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovani. Khronika obsuzhdeniia*, Jan. 1978, No.32, p.63-70, In Russian with English summary. Discussion p.79. 16 refs.

Glaciers, Snow cover distribution, Snow accumulation, Glacier ice, Mass balance, Glacier ablation, Alimentation.

33-2331

Disastrous phenomena developing on the northern slope of the Caucasus in relation to glacial-nival processes. (Katastroficheskie iavleniia severnogo sklon Bol'shogo Kavkaza svyazannye s nival'no-gliatsial'nymi protsessami). Gerasimov, V.A., *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovani. Khronika obsuzhdeniia*, Jan. 1978, No.32, p.71-76, In Russian with English summary. Discussion p.79. 23 refs.

Slope processes, Landslides, Mudflows, Avalanches, Solifluction, USSR—Caucasus.

33-2332

Investigation of creep instability as a mechanism for glacier surges. Paterson, W.S.B., et al, *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovani. Khronika obsuzhdeniia*, Jan. 1978, No.32, p.82-92, In Russian and English. Discussion p.190-191, 278-280. 30 refs.

Nitsan, U., Clarke, G.K.C. Glacier surges, Glacier flow, Glacier heat balance, Mathematical models, Antarctica—Byrd Station, Antarctica—Law Dome, Antarctica—Meserve Glacier.

A schematic model is offered to analyze creep instability as a possible mechanism for glacier surges. The main differences between the authors' analysis and those of previous workers are 1) inclusion of the effect of vertical advection, an important means of heat transfer, and 2) use of the Arrhenius relation for the temperature dependence of the flow law of ice rather than an approximation to it. Theoretical predictions are compared to field data gathered at three antarctic glaciers, two in Greenland, and a number in Canada.

33-2333

Internal heating and surges of nontemperate glaciers. (Vnutrennyi razogrev i podvizhki kholodnykh lednikov). Bozhinski, A.N., et al, *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovani. Khronika obsuzhdeniia*, Jan. 1978, No. 32, p.92-98, 210-213. In Russian and English. Discussion p.191, 278-279. 19 refs.

Grigorian, S.S. Glacier flow, Glacier heat balance, Glacier movement, Glacier surges, Antarctica—Meserve Glacier. Temperature gradients, heat conductivity, heat balance and pressure are discussed with relation to the possibility of analyzing flow and surging in cold glaciers. The mathematical analysis supports the theory that cold glacier movement is tied to internal heating especially at the bed. Data on a number of cold glaciers, including the Meserve Glacier in Antarctica, are compared in a chart.

33-2334

Theory of glacier oscillations. (Teoriia kolebani lednikov). Shumskii, P.A., *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovani. Khronika obsuzhdeniia*, Jan. 1978, No. 32, p.99-109, 213-233. In Russian and English. Discussion p.191-192, 279-280. 8 refs.

Glacier oscillation, Glacier ice, Glacier movement, Glacier surfaces.

33-2335

Sliding velocity of a surge-type glacier during its quiescent phase of motion. Bindshadler, R., et al, *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovani. Khronika obsuzhdeniia*, Jan. 1978, No. 32, p.109-117, 224-229. In Russian and English. Discussion p.192-193, 280-281. 10 refs.

Raymond, C., Harrison, W. Glacier movement, Glacier surges, Glacier ice, Glacier surfaces, Analysis (mathematics).

33-2336

Longitudinal compressive stresses in pulsating glaciers. (Prodol'nye napriazheniia szhatiia v pul'siruiushchem lednike). Volkovskii, K.F., *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovani. Khronika obsuzhdeniia*, Jan. 1978, No. 32, p.117-123, 229-232. In Russian and English. Discussion p.193, 280. 2 refs.

Glacier surges, Glacier ice, Stresses.

33-2337

Numerical calculation of adjustment of a glacier surface to perturbations of ice thickness. Landon, J., et al, *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovani. Khronika obsuzhdeniia*, Jan. 1978, No. 32, p.123-133, 233-239. In Russian and English. 20 refs.

Raymond, C. Glacier ice, Ice cover thickness, Glacier surfaces.

33-2338

Ablation streams as regulators of glacier pulsations. (Vozmozhnost' regulirovaniia roli zhidkogo stoka v rezhime pul'siruiushchego lednika). Kazanski, A.B., *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovani. Khronika obsuzhdeniia*, Jan. 1978, No. 32, p.133-137, 239-243. In Russian and English. Discussion p.193, 281. 4 refs.

Glacier ablation, Glacial hydrology, Runoff, Glacier surges.

33-2339

Studying the mechanism and causes of glacier surges by the natural analogues technique. (Izuchenie prichin i mekhanizma lednikovyykh podvizhek metodom prirodnykh analogov). Litosh, V.A., *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovani. Khronika obsuzhdeniia*, Jan. 1978, No. 32, p.137-143, 243-247. In Russian and English. 19 refs.

Glacier movement, Glacier surges, Models, Computerized simulation, Slope processes, Glacial erosion.

33-2340

Periodically surging Medvezhi Glacier matched with a general ice flow model. Budd, W.F., et al, *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovani. Khronika obsuzhdeniia*, Jan. 1978, No. 32, p.143-161, 247-260. In Russian and English. Discussion p.194-197, 281-285. 19 refs.

McInnes, B.G. Glaciers, Models, Glacier ice, Glacier movement, Flow rate, Glacier surges.

33-2341

Balance of the pulsating Medvezhi glacier as the basis for forecasting its periodic surges. (Balans pul'siruiushchego lednika Medvezh'ego kak osnova prognozirovaniia ego periodicheskikh podvizhek). Dolgushin, L.D., et al, *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovani. Khronika obsuzhdeniia*, Jan. 1978, No. 32, p.161-170, 260-265. In Russian and English. Discussion p.197-198, 285-286. 4 refs.

Osipova, G.B. Mountain glaciers, Glacier movement, Glacier surges, Glacier ice, Flow rate, Mass balance, Glacier ablation, Glacier surfaces, Alimentation, Avalanches.

33-2342

Surges of former ice sheets: their mechanism and environmental impact. Grosswald, M.G., et al, *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovani. Khronika obsuzhdeniia*, Jan. 1978, No. 32, p.170-184, 265-273. In Russian and English. 45 refs.

Hughes, J., Denton, G.H. Ice sheets, Ice growth, Ice deterioration, Dynamic properties, Ice shelves.

33-2343

Causes and nature of glacial oscillations in Pleistocene obtained by computer simulation. (Prichiny i kharakter lednikovyykh kolebani v Pleistotsene po dannym modelirovaniia na EVM). Sergin, V.I.A., et al, *Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovani. Khronika obsuzhdeniia*, Jan. 1978, No. 32, p.184-190, 274-277. In Russian and English. Discussion p.198-199, 285-286. 26 refs.

Sergin, S.I.A. Pleistocene, Glacier oscillation, Theories, Tectonics, Volcanoes, Meteorological factors, Geothermy.

33-2344

Tidal marshes in cold regions, particularly the St. Lawrence estuary. (Caractéristiques des schorres des régions froides, en particulier de l'estuaire du Saint-Laurent). Dionne, J.C., *Zeitschrift für Geomorphologie. Supplement*, July 1972, No.13, p.131-162. In French with English and German summaries. 46 refs.

Swamps, Tides, Estuaries, Sediment transport, Drift, Climatic factors, Canada—Saint Lawrence Estuary.

33-2345

Glaciers of the Mont Blanc Range (north slope) 1974-1977. (Les glaciers du massif du Mont-Blanc (versant nord) de 1974 à 1977). Veyret, P., *Revue de géographie alpine*, 1978, 66(2), p.105-113. In French.

Mountain glaciers, Glacier flow, Glacial erosion, Moraine, Glacial features, Glacier ablation, Alpine glaciation.

33-2346

Subglacial karst and its relation to deep karst. (Les karsts sous-glaciaires et leurs relations avec le karst profond). Maire, R., *Revue de géographie alpine*, 1978, 66(2), p.139-148. In French with English summary.

Karst, Subglacial caves, Glacial hydrology, Meltwater.

33-2347

Glacial and nival karst phenomena on the geomorphological map of the Southern Devoluy, Bure and Aurouze Plateaus. (Phénomènes glacio-karstiques et nivo-karstiques sur la carte geomorphologique de Devoluy meridional, plateaux de Bure et d'Aurouze). Nicod, J., *Revue de géographie alpine*, 1978, 66(2), p.149-165. In French with English summary.

Karst, Glacial features, Cirque glaciers, Glacial hydrology, Frost shattering, Talus, Nivation.

33-2348

Development of perennially frozen ore and placer deposits. (Razrabotka vechnomerzlykh rudnykh i rospynnykh mestorozhdenii poleznykh iskopaemykh). Emel'ianov, V.I., ed, *Magadan. Vsesoiuznyi nauchno-issledovatel'skii institut zolota i redkikh metallov. Sbornik nauchnykh trudov*, 1977, Vol.37, 110p., In Russian. For selected papers see 33-2349 through 33-2357. Refs. passim.

Placer mining, Artificial melting, Permafrost preservation, Artificial freezing, Ground ice, Permafrost hydrology, Permafrost, Cost analysis.

33-2349

Calculating hydraulic thawing of perennially frozen water-permeable rocks. (K raschetu gidravlicheskogo ottaivaniia massivov merzlykh vodopronitsaemykh porod). Perlshtein, G.Z., et al, *Magadan. Vsesoiuznyi nauchno-issledovatel'skii institut zolota i redkikh metallov. Sbornik nauchnykh trudov*, 1977, Vol.37, p.3-6, In Russian. 3 refs.  
Zinchenko, A.I., Korshunov, G.I.  
Frozen rocks, Artificial melting, Ground ice, Frozen sand, Peat, Heat transfer, Analysis (mathematics).

33-2350

Nomogram for calculating heat release of a "plane" seepage flow. (Nomogramma dlia rascheta teplootdachi "ploskogo" fil'tratsionnogo potoka). Chernykh, E.I.A., *Magadan. Vsesoiuznyi nauchno-issledovatel'skii institut zolota i redkikh metallov. Sbornik nauchnykh trudov*, 1977, Vol.37, p.7-10, In Russian. 3 refs.  
Placer mining, Heat transfer, Artificial melting, Ground ice, Permafrost, Analysis (mathematics), Water seepage.

33-2351

Numerical solution of the problem on hydraulic melting of permafrost. (K chislennomu resheniiu zadachi o gidravicheskom ottaivani merzlykh porod). Ignatov, A.A., et al, *Magadan. Vsesoiuznyi nauchno-issledovatel'skii institut zolota i redkikh metallov. Sbornik nauchnykh trudov*, 1977, Vol.37, p.10-20, In Russian. 11 refs.  
Perlshtein, G.Z., Chernykh, E.I.A.  
Placer mining, Heat transfer, Artificial melting, Permafrost, Analysis (mathematics), Water seepage.

33-2352

Studying thermal effect of water vapor condensation in sand dumps of underground excavations. (Issledovanie teplovogo effekta kondensatsii parov vody v otvalakh peskov podzemnoi dobychi). Zinchenko, A.I., et al, *Magadan. Vsesoiuznyi nauchno-issledovatel'skii institut zolota i redkikh metallov. Sbornik nauchnykh trudov*, 1977, Vol.37, p.21-29, In Russian. 6 refs.  
Papernov, I.M.  
Tailings, Frozen sand, Water vapor, Vapor transfer, Phase transformations, Mining, Arctic climate.

33-2353

Calculating heat-carrier temperature in the cold-air freezer tubes. (K raschetu temperatury teplonositelia v vozdukhnykh morozil'nykh kolonkakh). Znamenskiĭ, V.V., *Magadan. Vsesoiuznyi nauchno-issledovatel'skii institut zolota i redkikh metallov. Sbornik nauchnykh trudov*, 1977, Vol.37, p.30-46, In Russian. 4 refs.  
Permafrost hydrology, Taliks, Artificial freezing, Heat transfer, Analysis (mathematics).

33-2354

Computerized solution of the problem on ice lining of underground excavations. (Reshenie zadachi o ledianoi oblitovke podzemnykh vyrabotok na EVM). Chaban, P.D., et al, *Magadan. Vsesoiuznyi nauchno-issledovatel'skii institut zolota i redkikh metallov. Sbornik nauchnykh trudov*, 1977, Vol.37, p.47-58, In Russian. 6 refs.  
Gutin, I.M., Koriagina, T.N.  
Linings, Underground storage, Ice cover thickness, Permafrost, Analysis (mathematics), Computer applications.

33-2355

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The purpose of this document is to record and present the information and concepts that have been compiled and developed during the preliminary design of a 20,000 shp diesel electric icebreaker. This report deals with 2nd cycle preliminary structural design of a polar icebreaker for use in arctic and antarctic regions. It includes the development of dynamic ice loads, a critique on the possibility of fatigue failure, elastic vs plastic plate design and those structural analyses required to determine preliminary hull scantlings. (Auth.)

33-2476

Ice engineering—tensile properties of sea ice grown in a confined system. Dykins, J.E., U.S. Naval Construction Battalion Center, Port Hueneme, Calif. Civil Engineering Laboratory. Technical report, July 1970, NCEL-TR-689, 55p., AD-874 807, 10 refs. Sea ice, Tensile properties, Ice mechanics, Structural analysis, Shear stress.

Increasing operational use of ice areas in arctic and antarctic regions has created a need for improved knowledge for utilization of polar ice for shore based activities and floating platforms. Tensile strength envelopes were developed for horizontally and vertically oriented specimens of saline ice. The salinity, density, and petrographic structure of the 7- to 9-ppt salinity natural seawater ice, which was grown in the laboratory, are closely identifiable with the characteristics of sea ice formed in a natural environment. This observation was based on comparison of the upper 44 cm of laboratory ice with a similar thickness of natural sea ice. The tensile strength was found to be a nonlinear function of temperature; there were strong implications, however, that a linear relationship with salinity may exist. The strength was found to be dependent on orientation of the stress field with both the grain (crystal) and subgrain (platelet) structure. Limited study indicates that the tensile strength of saline ice is appreciably reduced as stress rates increase above 25 psi/sec. (Auth.)

33-2477

Methodology of comparing the economics of different construction projects. Zhukov, V.F., National Research Council, Canada. Technical translation, Feb. 1963, TT-1064, 17p., Translation of Predpostrochnoe protaivanie mnogoletnemerzlykh gornykh porod pri vozvedenii na nikh sooruzhenii. Akademiia nauk SSSR, Institut merzlotovedeniia, Moscow, 1958, p.21-38. Economic analysis, Cold weather construction, Foundations, Permafrost beneath structures, Maintenance, Permafrost preservation, Soil stabilization.

33-2478

Instructions for designing bearing media and foundations in the southern zone of the permafrost region. Akademiia stroitel'stva i arkhitektury SSSR. Institut osnovanii i podzemnykh sooruzhenii, National Research Council, Canada. Technical translation, Sep. 1967, TT-1298, 68p., Translation of Ukazaniia po proektirovaniu osnovanii i fundamentov dlia iuzhnoi zony rasprostraneniia vechnomerzlykh gruntov. Moscow, 1962, 77p. Standards, Permafrost beneath structures, Frost heave, Active layer, Ground thawing, Construction, Heat transfer, Settlement (structural), Bearing capacity.

33-2479

Guide for design and construction of pile foundations in permafrost (RSN-14-62). Russia. Gosudarstvennyi komitet po delam stroitel'stva, National Research Council, Canada. Technical translation, May 1968, TT-1314, 40p., Translation of Ukazaniia po proektirovaniu i ustroistvu svalnykh fundamentov na vechnomerzlykh gruntakh (RSN-14-62). Moscow, 1964. Pile foundations, Permafrost beneath structures, Soil strength, Drilling, Standards, Pile driving.

33-2480

Design of foundations, anchored in unfrozen ground, to resist heaving forces. Solov'ev, I.U.I., et al, National Research Council, Canada. Technical translation, Sep. 1970, TT-1424, 10p., For Russian original see SIP 19768. 4 refs. Puskov, V.I. Foundations, Frost heave, Soil freezing.

33-2481

Instructions for the design of townsites, factories, buildings and structures in the northern construction climatic zone (SN 353-66). Russia. Gosudarstvennyi komitet po delam stroitel'stva, National Research Council, Canada. Technical translation, July 1972, TT-1547, 105p., Translation of Ukazaniia po proektirovaniu naselennykh mest, predpriatii, zdani i sooruzhenii v severnoi stroitel'no-klimaticheskoi zone (SN 353-66). Moscow, 1967. Urban planning, Climatic factors, Buildings, Water supply, Utilities, Dams, Railroads, Gas pipelines, Water pipelines.

33-2482

Method of interpreting seismic reflection data in the Vilyuy syncline. Shutkin, A.E., et al, National Research Council, Canada. Technical translation, Dec. 1973, TT-1709, 13p., For Russian original see 24-1071. 4 refs. Kharlova, O.I. Seismic reflection, Permafrost structure, Acoustic measurement, Frozen ground physics, Seismic velocity.

33-2483

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33-2484

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33-2485

Transplantation of trees and shrubs to the Far North. (Pereselenie derev'ev i kustarnikov na Kraiñii Sever). Aleksandrova, N.M., et al, Leningrad, Nauka, 1978, 115p., In Russian with English a table of contents enclosed. Refs. p.107-114. Golovkin, B.N. Taiga vegetation, Subarctic vegetation, Revegetation, Trees (plants), Tundra vegetation, Plant physiology, Introduced plants, Subarctic soils, Subarctic climate.

33-2486

Pipeline construction on swamps and permafrost. (Stroitel'stvo truboprovodov na bolotakh i mnogoletnemerzlykh gruntakh). Dertsakian, A.K., et al, Moscow, Nedra, 1978, 167p., In Russian with English table of contents enclosed. 11 refs. Vasil'ev, N.P. Swamps, Permafrost distribution, Pipelines, Permafrost beneath structures, Pipeline supports, Earthwork, Pipe laying.

33-2487

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33-2488

Yamal-Gyda Region (physiographic characteristics). (Amalo-Gydanskaiia oblast' (fiziko-geograficheskaiia kharakteristika)). Sisko, R.K., ed, Leningrad, Gidrometeoizdat, 1977, 309p. (Pertinent p.123-137, 198-225, 261-289). In Russian. 324 refs. DLC GB327.Y351175 Arctic climate, Arctic vegetation, Swamps, Tundra vegetation, Taiga vegetation, Forest tundra, Cryogenic soils, Arctic soils, Landscape types, Maps, Charts, USSR—Yamal Peninsula, USSR—Gyda Peninsula.

33-2489

Possible presence of deep ground waters on Mars and Moon. (Vozmozhnoe sushchestvovanie glubinykh vod na Lune i Marse). Frolov, P.M., et al, Vsesoiuznyi nauchno-issledovatel'skii institut gidrogeologii i inzhenernoi geologii. Trudy, 1975, Vol.79, p.100-123, In Russian. Katterfel'd, G.N. DLC GB1004.V66 Moon, Mars (planet), Ground water, Extraterrestrial ice, Permafrost.

33-2490

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33-2491

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33-2492

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Heat transfer, Ice accretion, Ice melting, Radiant heating.
- 33-2494  
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Frozen fines, Peat, Core samplers, Portable equipment.
- 33-2495  
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Parashar, S.K., et al, *Memorial University of Newfoundland. Centre for Cold Ocean Resources Engineering. C-CORE publication*, Dec. 1, 1977, 77-6, 96p., Bibliography p.91-96.  
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Remote sensing, Sea ice, Ice cover thickness, Measuring instruments, Radar echoes, Ice physics.
- 33-2496  
Measurement of surface strain on Drake P-40 artificially thickened sea ice drilling platforms.  
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- 33-2497  
Ship-in-the-ice data report.  
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Culshaw, S.T., comp.  
Expeditions, Sea ice, Strains, Oceanography.
- 33-2498  
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Sea ice, Icebergs, Radar echoes, Research projects, Aerial photography.
- 33-2499  
Forecasting ice appearance dates for the Pechora River using the method of meteorological field expansion according to natural orthogonal components. (Primenenie metoda razlozheniya meteorologicheskikh poloi po estestvennym ortogonal'nym sostavliushchim pri prognoze pojavaeniya l'da na r. Pechore); Shanochkin, S.V., *Leningrad. Gosudarstvennyi gidrologicheskii institut. Sbornik rabot po gidrologii*, 1977, No.12, p.18-23, In Russian. 10 refs.  
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- 33-2502  
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Snowmelt, Solar radiation, Radiation absorption, Snow water equivalent, Ice physics, Snow physics, Analysis (mathematics).
- 33-2503  
Hydraulic and morphometric characteristics of slope runoff. (Issledovanie gidravlicheskikh i morfometricheskikh kharakteristik sklonovykh potokovy).  
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Slope processes, Soil freezing, Frost penetration, Frozen ground, Snow cover effect, Snowmelt, Runoff, Soil erosion.
- 33-2504  
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Soil moisture, Frost penetration, Soil freezing, Snow water equivalent, Snowmelt, Runoff, Soil erosion.
- 33-2505  
Selection of interpretation indices for black-and-white aerial photographs of underlying surfaces obtained by the "Meteor" satellite during a winter-spring season. (Vybor deshifirovochnykh priznakov dlia cherno-belykh izobrazhenii podstilaiushcheli poverkhnosti po snimkam sputnik "Meteor" v zimne-vesennii period).  
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- 33-2506  
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DLC TA705.K58  
Clay soils, Soil mechanics, Soil moisture migration, Rheology, Buildings, Foundations, Cold weather performance, USSR—Kola Peninsula.
- 33-2507  
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- 33-2508  
Forecasting and preventing ground water rise on construction sites. (Prognoz i predotvrashchenie podtopleniia gruntovymi vodami territorii pri stroitel'stve).  
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- 33-2509  
Hydraulic concretes. (Gidrotekhnicheskie betony).  
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Sea ice, Fast ice, Ice cover thickness, Salinity, Crystal structure.
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Satellite ocean-related imagery applications program.  
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Remote sensing, Spaceborne photography, Sea ice distribution, Water temperature, Icebergs.
- 33-2512  
Analogue data telemetry system for sea ice work.  
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Sea ice, Ice mechanics, Strain measuring instruments, Telemetering equipment.
- 33-2513  
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Remote sensing, LANDSAT, Icebergs, Aerial reconnaissance, Radar echoes.
- 33-2514  
Four channel synthetic aperture radar imagery results of freshwater ice and sea ice in Lake Melville.  
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Radar echoes, Lake ice, Sea ice, Salinity, Ice structure, Ice physics.
- 33-2515  
Detection and monitoring of oil pollution in the ice environment through microwave techniques.  
Parashar, S.K., et al, *Memorial University of Newfoundland. Centre for Cold Oceans Resources Engineering. C-CORE publication*, Aug. 1978, 78-12, 19p., Presented at the Fifth Canadian Symposium on Remote Sensing, Victoria, B.C., Aug. 28-31, 1978. 40 refs.  
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Oil spills, Oil pollution, Sea ice, Microwaves, Ice structure, Wind factors, Ocean currents, Brightness.
- 33-2516  
Measurement of subsurface strain on Roche 0-43 artificially thickened sea ice drilling platform.  
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Artificial islands, Artificial ice, Offshore drilling, Strain measuring instruments.
- 33-2517  
Surface strain of artificially thickened ice drilling platforms.  
Allan, A., *Memorial University of Newfoundland. Centre for Cold Oceans Resources Engineering. C-CORE publication*, Nov. 1978, 78-17, 7p. + 6 figs., 7 refs.  
Artificial islands, Artificial ice, Strains, Offshore drilling.
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Barns, R.L.  
Ice crystal growth, Ice crystal structure, Crystallization.

- 33-2519**  
Icebergs for use as fresh water.  
U.S. Environmental Data Service, Washington, D.C., 1978, 12p. PB-285 664.  
Icebergs, Water supply.
- 33-2520**  
Selected bibliography of disturbance and restoration of soils and vegetation in permafrost regions of the USSR (1970-1977).  
Andrews, M., *U.S. Army Cold Regions Research and Engineering Laboratory*, Oct. 1978, SR 78-19, 175p. ADA-062 339.  
Bibliographies, Human factors, Environmental impact, Continuous permafrost, Discontinuous permafrost, Revegetation, Cryogenic soils, Damage.  
This compilation of literature, published in Russian since 1970, comprises 1225 bibliographic citations relating to disturbance and restoration of soils and vegetation. Sixty-five percent of these were found by a manual search of CRREL Bibliography Vols. 25-32; the others were obtained through off-line searches from the relevant computerized data bases and personal files. Only one of these data bases, that of the National Agricultural Library, is shown to be of significance in providing a valuable checking source. The literature is discussed in chronological fashion, with general statements followed by highlights of each year's contributions. The years 1972 and 1973 produced the most publications, and by 1976 there was a noticeable lag in pickup of publications by the indexing services. A trend is apparent from a reconnaissance and description approach in earlier papers toward an integrated ecosystem approach in more recent publications. Increased consciousness of the effects of disturbance on the permafrost environment, and the importance of restoration and preservation of these environments, are reflected in the recent literature, particularly in symposium proceedings.
- 33-2521**  
Computer file for existing land application of wastewater systems: a user's guide.  
Iskandar, I.K., et al, *U.S. Army Cold Regions Research and Engineering Laboratory*, Nov. 1978, SR 78-22, 24p., ADA-062 658, 4 refs.  
Robinson, D., Willcockson, W., Keefauver, E.  
Waste disposal, Water treatment, Computer programs.  
Two computer programs, both written in BASIC, have been developed to store and retrieve information on existing wastewater land treatment systems. The purpose of establishing these programs is to provide assistance to design engineers during the planning of new land treatment systems by making available the design criteria and performance characteristics of operating systems. The SEARCH program is designed to locate systems with specific design parameters, such as flow rate, waste type, application rate and mode, ground cover and length of operation. The PRINTOUT program includes a list of articles on similar systems in addition to the design parameters. The UPDATE program is used for the revision of information on file. Currently, there are about 350 domestic and 75 foreign systems on file.
- 33-2522**  
Engineering aspects of an experimental system for land renovation of secondary effluent.  
Nylund, J.R., et al, *U.S. Army Cold Regions Research and Engineering Laboratory*, Nov. 1978, SR 78-23, 26p. ADA-062 923.  
Larson, R.E., Clapp, C.E., Linden, D.R., Larson, W.E.  
Waste disposal, Water treatment, Waste treatment, Irrigation, Land reclamation.  
A research system was designed and installed at the Apple Valley Wastewater Treatment Plant, two miles south of Rosemount, Minnesota, to develop agricultural management practices for removal of nitrogen from municipal wastewater effluent. A solid set irrigation system was designed and installed to apply wastewater effluent to 12 test blocks, each measuring 60 x 150 ft. A perforated plastic drainage tile was placed lengthwise in each block at a depth equivalent to the normal water table level and opening at one end of the block into a sampling station. Six blocks were planted to corn and six planted to eight species of forages. The effluent was applied at rates up to 15 ft/yr. This report presents the engineering considerations in the design of a solid set irrigation system and drain tile and monitoring system for evaluating the influence of the effluent application and agronomic practices on drainage waters.
- 33-2523**  
Increasing the effectiveness of soil compaction at below-freezing temperatures.  
Haas, W.M., et al, *U.S. Army Cold Regions Research and Engineering Laboratory*, Nov. 1978, SR 78-25, 58p., ADA-062 875, 57 refs.  
Alkire, B.D., Kaderabek, T.J.  
Soil compaction, Frozen ground compression, Compressive strength, Soil water, Chemical reactions.  
This report presents data from an experimental program undertaken to determine the effect of low temperatures on the compaction characteristics of a silty sand. The effects of compactive effort and chemical additives were also investigated to determine possible methods of improving the densities of soils placed and compacted at low temperatures. A single soil type was used throughout the test program, and test results were obtained using Standard and Modified AASHTO compactive efforts on an untreated soil prepared and tested at temperatures of 20°C and -7°C. Additional test series, using the same compactive efforts and temperatures, were performed on the soil after it had been treated with an additive. The amounts of additive used, based on the dry weight of soil, were 3, 2, 1, 0.5, and 0.25% of calcium chloride and 0.5% of sodium chloride. From the results of the experimental program, several important conclusions concerning the effect of low temperature compaction were drawn.
- 33-2524**  
Wastewater stabilization pond linings.  
Middlebrooks, E.J., et al, *U.S. Army Cold Regions Research and Engineering Laboratory*, Nov. 1978, SR 78-28, 116p., ADA-062 903, Refs. p.63-66.  
Perman, C.D., Dunn, I.S.  
Waste disposal, Water treatment, Stabilization, Ponds, Linings, Sealing, Seepage.  
A review of the literature on wastewater stabilization lagoon linings, covering the work during the past 20 years, is presented. Design, operating and maintenance experiences are presented for soil sealants, natural sealants, bentonite clays, chemical treatments, gunite, concrete, asphaltic compounds, plastics and elastomers. The characteristics of various materials, applicability to different wastes, construction techniques and details of installation techniques are presented. Installation costs for various materials and comparative costs are summarized. A summary of reported seepage rates for various types of lining materials is presented. A survey of the 50 states was conducted to determine the requirements for liners and allowable seepage rates. Requirements are varied and depend upon the local soil conditions and the experiences of the regulatory agencies with various materials. The trend is toward more stringent requirements. Accepted design and installation procedures are summarized, and detailed drawings of installation techniques are presented. Recommendations of the manufacturers and installers of liners are also presented.
- 33-2525**  
Summary of Corps of Engineers research on roof moisture detection and the thermal resistance of wet insulation.  
Tobiasson, W., et al, *U.S. Army Cold Regions Research and Engineering Laboratory*, Dec. 1978, SR 78-29, 6p., ADA-063 144, 12 refs.  
Korhonen, C.  
Roofs, Moisture transfer, Detection, Infrared spectroscopy.  
Nuclear, infrared, capacitance, microwave and impulse radar methods for nondestructively detecting moisture in roofs were evaluated. No system was reliable enough by itself or by cross-checking with another system to eliminate the need for a few core samples of membrane and insulation to verify findings. Airborne infrared surveys are a cost-effective way of reconfirming numerous roofs at a major installation. However, follow-up on the roof surveys are necessary. Of the several grid techniques examined, nuclear surveys were the most reliable. Hand-held infrared surveys are the most accurate on-the-roof method studied. Although an infrared camera costs significantly more than a nuclear meter (\$27,000 vs \$3,000), infrared surveys can be conducted more rapidly. Where numerous roofs are to be surveyed, infrared surveys appear to be the most cost-effective method. *In-situ* measurements have been made of the thermal resistance of wet and dry portions of roofs. A laboratory apparatus has been built to subject 12 in x 12 in specimens of roof insulation to combined thermal and moisture gradients. Thermal resistance and moisture content are periodically determined, and characteristic curves are being developed for various roof insulations.
- 33-2526**  
Ice fog suppression using reinforced thin chemical films.  
McFadden, T., et al, *U.S. Army Cold Regions Research and Engineering Laboratory*, Nov. 1978, SR 78-26, 23p., ADA-063 107, 20 refs.  
Collins, C.M.  
Ice fog, Fog dispersal, Chemical ice prevention.  
Ice fog suppression experiments on the Fort Wainwright Power Plant cooling pond were conducted during the winters of 1974-76. Baseline information studies occupied a sizable portion of the available ice fog weather in 1974-75. Then hexadecanol was added to the pond and dramatically improved visibility by reducing fog generated from water vapor released by the pond at -14°C. Although this temperature was not low enough to create ice fog, the cold vapor fog created was equally as devastating to visibility in the vicinity of the pond. During the winter of 1975-76, suppression tests were continued, using films of hexadecanol, mixtures of hexadecanol and octadecanol, and ethylene glycol monobutyl ether (EGME). Suppression effectiveness at colder temperatures was studied and limits to the techniques were probed. A reinforcing grid was constructed that prevented breakup of the film by wind and water currents. Lifetime tests indicated the EGME degrades much more slowly than either hexadecanol or the hexadecanol-octadecanol mix. The films were found to be very effective fog reducers at warmer temperatures but still allowed 20% to 40% of normal evaporation to occur. The vapor thus produced was sufficient to create some ice fog at lower temperatures, but this ice fog occurred less frequently and was more quickly dispersed than the thick fog that was present before application of the films.
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Bearing capacity of river ice for vehicles.  
Nevel, D., *U.S. Army Cold Regions Research and Engineering Laboratory*, Apr. 1978, CR 78-3, 22p., ADA-055 244, 7 refs.  
River ice, Ice bearing capacity, Vehicles, Floating ice.  
The mathematical theory for the bearing capacity of river ice for vehicles is presented. The floating ice sheet is assumed to have simple supports at the shore line. Solutions are presented for loads uniformly distributed over circular and rectangular areas. Numerical evaluations are made for a number of vehicles and the results presented in graphical form.
- 33-2528**  
Peculiarities of drilling and blasting under permafrost conditions. (Osobennosti proizvodstva burovzryvnykh rabot v usloviakh vechnoi merzloty).  
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Frozen fines, Drilling, Blasting, Permafrost.
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Artificial freezing of rocks when sinking the shaft of the Yakovlevsk mine (Kursk magnetic anomaly). (O zamorazhivanii gornykh porod pri sooruzhenii stvoia IAkovlevskogo rudnika KMA).  
Nasonov, I.D., et al, *Shakhtnoe stroitel'stvo*, Sep. 1978, No.9, p.7-11, In Russian. 2 refs.  
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Mining, Shaft sinking, Artificial freezing, Frozen rocks.
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Distances between the tubes of artificial rock freezing assemblies. (O rasstoianiiakh mezhdu zamorazhivaiushchimi skvazhinami).  
Shparber, P.A., *Shakhtnoe stroitel'stvo*, Nov. 1978, No.11, p.19-22, In Russian. 3 refs.  
Shaft sinking, Frozen rocks, Artificial freezing, Mining.
- 33-2531**  
Melting of ice in sea water: a primitive model with application to the antarctic ice shelf and icebergs.  
Gade, H.G., *Journal of physical oceanography*, Jan. 1979, 9(1), p.189-198, 17 refs.  
Sea ice, Ice shelves, Icebergs, Ice melting, Sea water, Ice models.  
Steady-state conditions are assumed to exist everywhere in the case of melting of the underside of an infinite slab of ice floating in sea water. Basic transfer equations for heat and salt are established, and solutions derived for the interior corresponding to given far field values of the temperature and salinity of the water. The solutions are discussed in the T-S diagram where the behavior is particularly simple. Determining parameters are the characteristic velocities  $k_d$  and  $k_h$ , where  $k_d$  and  $k_h$  are the molecular and turbulent diffusivities, respectively, of salt,  $d$  and  $h$ , the thicknesses of the corresponding laminar and turbulent layers. Also, the nonmelting/nonfreezing case is discussed and the determining parameter established. Application of the theory to the Ross Ice Shelf (Little America V) gives acceptable results. Analysis of the static stability of the melt water mixtures reveals that with ambient temperatures approaching 17°C, the stratification becomes unstable. Icebergs brought to tropical waters will cause melt water mixtures to intrude at subsurface levels. Finally, convection obtained in laboratory experiments with melting ice in sea water is reported to be in concordance with the theoretically derived stability criterion. (Auth.)
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Role of lichens in antarctic ecosystems.  
Lindsay, D.C., *Bryologist*, Summer 1978, 81(2), p.268-276, 49 refs.  
Lichens, Ecosystems, Soil microbiology.  
Antarctic terrestrial ecosystems can be divided into two main series: those of continental Antarctica and those of the maritime Antarctic. Within the former series, plant communities exist as isolated groupings of plants growing under a severe continental polar-desert climate and appear to be similar to communities of the High Arctic (e.g. the interior plateau of Devon Island). Communities in the maritime Antarctic region are more diverse, with less severe environmental conditions, and show affinities with lichen communities occupying similar habitats in boreal-Arctic zones of the northern hemisphere. Roles played by lichens in the two series of ecosystems are influenced considerably by environmental conditions and in continental Antarctica are often completely subordinated to physical processes. Weathering of substrata, for instance, in continental Antarctica, consists of the operation of several physical processes with lichens playing an insignificant role. It is only in the more suitable habitats found in the maritime Antarctic that lichens are able to play their full role in the development and functioning of ecosystems. (Auth.)

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33-2580

Generalized scheme for the classification of cryogenic structures of fine-grained deposits. (Obobshchennaya skhema klassifikatsii kriogennykh tekstur dispersnykh otlozheniy). Maksimova, L.N., Obshchee merzlotovedenie. Materialy k III Mezhdunarodnoi konferentsii po merzlotovedeniiu (General geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1978, p.60-69, In Russian. 13 refs.

Frozen fines, Cryogenic structures, Classifications.

33-2581

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Shpolianskaia, N.A.

Forest tundra, Permafrost structure, Cryogenic processes, Thermal regime, Frozen rock temperature, Heat balance, Tundra.

33-2582

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Alluvium, Loess, Frozen fines, Ground ice, Cryogenic processes, Permafrost structure, Ice veins, USSR—Yakutia.

33-2583

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Alluvium, Glacial deposits, Frozen fines, Frozen gravel, Cryogenic structures.

33-2584

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Frozen fines, Microstructure, Permafrost samplers, Microscope slides, Electronic equipment, Cold chambers, Laboratory techniques.

33-2585

Influence of the base-layer of ground on formation of the contacting bottom-layer of ice. (Vliyanie gruntovogo osnovaniya na formirovaniye prikontaktnogo sloia l'da).

Solomatin, V.I., et al., Obshchee merzlotovedenie. Materialy k III Mezhdunarodnoi konferentsii po merzlotovedeniiu (General geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1978, p.98-101, In Russian.

Kriuchkov, M.V., Kabanova, T.N. Ground ice, Ice formation, Ice models, Soil freezing, Ice growth.

33-2586

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Permafrost structure, Ground ice, Ice sheets, Ice formation, Ice structure, Ice deformation, Ice composition, Ice crystal structure.

33-2587

Improving the techniques of drilling and sampling frozen rocks and ice. (Sovershenstvovanie tekhnologii bureniya i otbora prob v merzlykh porodakh i l'dakh). Kudriashov, B.B., et al., Obshchee merzlotovedenie. Materialy k III Mezhdunarodnoi konferentsii po merzlotovedeniiu (General geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1978, p.112-123, In Russian. 9 refs.

Chistiakov, V.K.

Permafrost structure, Ground ice, Drilling, Permafrost samplers, Boreholes, Ice sampling, Thermal regime.

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Thermokarst, Ground ice, Ice melting, Active layer, Cryogenic relief, Origin, Ice veins, Thermokarst lakes, Terminology.

33-2589

Systems approach to the study of thermokarst. (K izucheniiu termokarsta na osnove sistemnogo podkhoda). Shur, I.U.L., Obshchee merzlotovedenie. Materialy k III Mezhdunarodnoi konferentsii po merzlotovedeniiu (General geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1978, p.131-141, In Russian. 31 refs.

Thermokarst, Permafrost hydrology, Thermokarst lakes, Ice veins, Ice melting, Polygonal topography, Systems analysis.

33-2590

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Cryogenic processes, Slope processes, Solifluction, Mudflows, Soil moisture, Frozen fines, Ground thawing, Terminology.

33-2591

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Nekrasov, I.A. Glacial hydrology, Naleds, Origin, Mountain glaciers, Glacier oscillation, Periglacial processes.

33-2592

Probability approach to frost fracturing. (Veroyatnostnyi podkhod k obrazovaniyu morozobolnykh treshchin).

Podbornyi, E.E., Obshchee merzlotovedenie. Materialy k III Mezhdunarodnoi konferentsii po merzlotovedeniiu (General geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1978, p.156-161, In Russian. 15 refs.

Soil freezing, Frost penetration, Frost shattering, Ground ice, Ice veins, Snow cover effect, Statistical analysis.

33-2593

Underground drainage in different cryohydrogeological structures of East Siberia. (Osobennosti podzemnogo stoka v razlichnykh kriogidrogeologicheskikh strukturakh Vostochnoi Sibiri). Afanasenko, V.E., Obshchee merzlotovedenie. Materialy k III Mezhdunarodnoi konferentsii po merzlotovedeniiu (General geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1978, p.161-165, In Russian. 4 refs.

Permafrost distribution, Water supply, Water reserves, Permafrost hydrology, Water chemistry, Suprapermafrost ground water, Subpermafrost ground water, Taliks.

33-2594

Formation of ground water reserves in the cryolithosphere, related to vertical zonality of water balance elements in mountains. (O nekotorykh osobennostyakh formirovaniya zapasov podzemnykh vod kriolitofery, obuslovlennykh vertikal'noi zonal'nost'iu elementov vodnogo balansa v usloviakh gornogo rel'efa).

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Mel'nikova, T.V., Motrich, L.T., Papernov, I.M. Permafrost hydrology, Water reserves, Suprapermafrost ground water, Subpermafrost ground water, Frozen rock temperature, Permafrost thermal properties, Water balance.

33-2595

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Shamanova, I.I. Permafrost hydrology, Taliks, Thermokarst, Permafrost structure, Ground ice, Forest tundra, Lakes, Permafrost beneath lakes.

33-2596

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Motrich, L.T. Water supply, Permafrost hydrology, Taliks, Artificial melting, Ground ice.

33-2597

Applying systems analysis to permafrost forecasting in engineering and geological investigations. (Mnogoletnemerzlye skal'nye porody kak ob'ekt sistemnogo prognozirovaniya pri inzhenerno-geologicheskikh issledovaniyakh).

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Krivosnogo, N.F. Engineering geology, Permafrost structure, Permafrost forecasting, Permafrost distribution, Permafrost hydrology, Frozen rock temperature, Ground ice, Ice formation, Systems analysis.

33-2598

Ecologic conditions of natural and disturbed land in the cryolithozone of West Siberia. (Ekologicheskie uslovia estestvennykh i narushennykh territorii kriolitofony Zapadnoi Sibiri). Moskalenko, N.G., et al., Obshchee merzlotovedenie. Materialy k III Mezhdunarodnoi konferentsii po merzlotovedeniiu (General geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1978, p.197-204, In Russian. 6 refs.

Shur, I.U.L. Permafrost distribution, Tundra soils, Taiga soils, Taiga vegetation, Tundra vegetation, Plant ecology, Human factors, Forest tundra, Soil erosion, Permafrost degradation.

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Permafrost distribution, Ground ice, Taiga soils, Taiga vegetation, Soil moisture, USSR—Pur River, Ussr—Nadym River.
- 33-2600**  
Dynamics of temperature fields in seasonally and perennally frozen rocks in Central Yakutia when the surface covers are disturbed. (Dinamika temperatury polia sezonno- i mnogoletnemerzlykh porod pri narushenii pokrovov v Tsentral'noi Iakutii). Zabolotnik, S.I., Obshchee merzlotovedenie. Materialy k III Mezhdunarodnoi konferentsii po merzlotovedeniiu (General geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1978, p.210-214, In Russian. 4 refs.  
Permafrost thermal properties, Permafrost depth, Active layer thickness, Frozen ground temperature, Vegetation factors, Soil disturbance, USSR—Yakutia.
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Climatic changes, Permafrost thermal cycles, Frozen rock temperature, Snow cover effect.
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Geocryology, Charts, Permafrost distribution, Permafrost structure, Permafrost hydrology, Mapping.
- 33-2604**  
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Road maintenance, Winter maintenance, Snow removal.
- 33-2629**  
Trace metals in antarctic snows since 1914.  
Boutron, C., et al, *Nature*, Feb. 15, 1979, 277(5697), p.551-554, 21 refs.  
Lorius, C.  
Snow composition, Aerosols, Atmospheric composition, Chemical composition.  
The results of the variations of the concentrations of 12 elements, including Pb, Cd, Cu, Zn and Ag in snow deposited from 1914 to 1974 at an uncontaminated site in East Antarctica, are discussed here. As the composition of snow in central Antarctica is shown to be closely correlated to that in the lower atmosphere, this provides a valuable historical record of the composition of remote aerosols in the Southern Hemisphere. It is found that Pb, Cd, Cu, Zn and Ag were already strongly enriched 60 yr ago (with respect to the composition of reference crustal and marine sources), and that both the concentrations and the enrichment factors observed in 1914 for these five elements are comparable to the present ones. This suggests that the present background atmospheric concentrations of Pb, Cd, Cu, Zn and Ag in the Southern Hemisphere are not strongly influenced by global pollution, but are related to natural phenomena, possibly volcanism.
- 33-2630**  
Polar icebreaker cruise report, Operation Deep Freeze '79.  
U.S. Coast Guard, Seattle, Washington, Mar. 8, 1979, Var. p.  
Ice navigation, Ice breaking, Ships.  
This cruise report presents details of operations aboard the USCGC icebreaker *Polar Star* in support of *Deep Freeze '79*. The main tasks of the cruise were to break open the channel to McMurdo Sound and provide science logistics support. Other tasks included conduct training and gathering engineering data. The following events are described: ship and air operations, navigation, communications and postal affairs, science activities, engineering aspects, administration, supply and logistics, medical practices, and public relations. Assigned personnel and recommendations for future cruises are listed.
- 33-2631**  
British Antarctic Survey. *Marine observer*, Oct. 1978, 48(262), p.188-195 + photos.  
Research projects, Ice sheets, Glaciology, Radio echo soundings.  
This paper traces the history of the British Antarctic Survey and describes its bases and support vessels, organization, administration, and scientific research activities. The Survey maintains permanent bases at South Georgia, Signy I., Argentine Is., Rothera Point, and Halley Bay. Another small base at Darnley Point, Wiencke I. serves as an air facility and transit point. Logistics and research support are provided by the vessels John Biscoe and Bransfield, and two ski-wheeled Twin-Otter aircraft. The Survey's staff numbers about 360. Research activities include programs in the atmospheric sciences, geology, geophysics, glaciology, biology, and physiology.
- 33-2632**  
Road winter service. (Strassen-Winterdienst), Dultinger, J., Innsbruck, Dr. Rudolf Erhard, 1976, 248p., In German. 44 refs.  
Winter maintenance, Snow removal equipment, Heating, Avalanche countermeasures, Deicers, Snow fences, Salting, Road maintenance, Ice removal, Road icing.
- 33-2633**  
Winter trafficability: International congress and fair at Dobbiaco, Italy. (Viabilité hivernale: le congrès international et le concours de matériels de Dobbiaco (Italie)). *Revue générale des routes et des aérodrômes*, Apr. 1978, No.541, p.87-131, In French. For selected papers see 33-2634 through 33-2636.  
Winter maintenance, Roads, Snow removal equipment, Ice removal, Deicers.
- 33-2634**  
Profitability of investments and technological and organizational improvement of winter services. (Rentabilité des investissements et amélioration des techniques et de l'organisation en matière de viabilité hivernale). *Revue générale des routes et des aérodrômes*, Apr. 1978, No.541, p.88-94, 97-104, 109, In French.  
Road maintenance, Salting, Winter maintenance, Deicing, Snow removal, Cost analysis, Accidents.
- 33-2635**  
Winter trafficability in France. (La viabilité hivernale en France). Monot, J., et al, *Revue générale des routes et des aérodrômes*, Apr. 1978, No.541, p.115, 117-119, In French.  
Bachelard, G.  
Winter maintenance, Road maintenance, Snow removal equipment, Trafficability, Economic analysis, France.
- 33-2636**  
Development, construction and operation of an icing warning system in the Netherlands. (Développement, construction et fonctionnement d'un projet d'alerte au verglas aux Pays-Bas). Ten Cate, A.J., *Revue générale des routes et des aérodrômes*, Apr. 1978, No.541, p.122-123, 125-127, In French.  
Road icing, Ice forecasting, Warning systems, Surface temperature, Humidity.
- 33-2637**  
Studded tires; summary of experiments conducted in France, 1971-1977; support of the new regulations. (Les pneus à crampons; synthèse des essais effectués en France de 1971 à 1977; mise au point de la nouvelle réglementation). Fève, M., *Revue générale des routes et des aérodrômes*, Oct. 1978, No.546, p.51-63, In French. 20 refs.  
Tires, Road maintenance, Damage, Winter maintenance, Tests.
- 33-2638**  
Cold weather concreting.  
American Concrete Institute. Committee 306, *American Concrete Institute. Journal*, May 1978, 75(5), p.161-183, 26 refs.  
Winter concreting, Cold weather construction, Concrete curing, Frost protection, Concrete heating, Concrete strength, Thermal insulation, Concrete hardening, Thermal properties, Reinforced concrete.
- 33-2639**  
Design of concrete bridges for temperature gradients.  
Priestley, M.J.N., *American Concrete Institute. Journal*, May 1978, 75(5), p.209-217, 19 refs.  
Bridges, Prestressed concrete, Reinforced concrete, Thermal stresses, Thermal regime, Cracking (fracturing), Heat transfer, Structural analysis, Trafficability, Design.
- 33-2640**  
On the origin of mineral impurities in ice.  
Picciotto, E.E., *U.S. Army Cold Regions Research and Engineering Laboratory*, Jan. 1979, TL 696, 21p., ADA-063 315, 6 refs. For French original see 32-3814.  
Firn, Glacier ice, Ice composition, Isotopes, Impurities, Antarctica—Plateau Station.  
Mineral impurities can originate from four main sources: the ocean, the lithosphere, extra-terrestrial space and man's activities. Whatever the particular objective envisaged, besides analytical problems, any research in this field faces a common general problem: determination of the relative contributions from each source. This paper discusses chemical and isotopic methods which will give a solution to this problem. The main difficulty lies in the large chemical fractionations which appear to take place at all stages of the passage between the source and the place of deposition. Two cases of definite identification of the origin are presented: evaluation of the extraterrestrial component in firn samples from Plateau Station (East Antarctica) based on the measurement of Mn-53, and the identification of a man-made component in the Pb found in an alpine glacier, based on the relative abundance of the stable isotopes of Pb. (Auth.)
- 33-2641**  
Physical characteristics of geophysical processes in polar oceans.  
Bogorodskii, V.V., ed., *U.S. Army Cold Regions Research and Engineering Laboratory*, Jan. 1979, TL 702, 82p., ADB-033 914, Distribution limited to U.S. Government agencies only. For Russian original see 33-716 through 33-719, 33-721, 33-724, 33-725, 33-731, 33-732, 33-1417, and 33-1418. For individual papers see 33-2642 through 33-2652.  
Gusev, A.V., ed.  
Sea ice, Drift, Physical properties, Ice composition, Ice optics, Ice temperature, Temperature variations.  
These translated articles treat various aspects of the upper layers of arctic drift ice, including: chemical and physical characteristics; electrical parameters related to temperature and salinity; electrical microstructure; electromagnetic sounding; optical properties; temperature variations; acoustic emissions as a breakup indicator; cloud cover effects on sea ice; and icebergs in the Southern Ocean.
- 33-2642**  
Physical and chemical characteristics of upper layers of ice of varying age in the area of SP-22.  
Khokhlov, G.P., *U.S. Army Cold Regions Research and Engineering Laboratory*, Jan. 1979, TL 702, Physical characteristics of geophysical processes in polar regions, edited by V.V. Bogorodskii and A.V. Gusev, p.1-10, ADB-033 914, 1 ref. For Russian original see 33-716. Distribution limited to U.S. Government agencies only.  
Sea ice, Ice physics, Ice composition, Ice salinity.
- 33-2643**  
Relationship between the electrical parameters of the upper layers of Arctic drift ice in the microwave range and temperature and salinity.  
Bogorodskii, V.V., et al, *U.S. Army Cold Regions Research and Engineering Laboratory*, Jan. 1979, TL 702, Physical characteristics of geophysical processes in polar regions, edited by V.V. Bogorodskii and A.V. Gusev, p.11-18, ADB-033 914, 11 refs. For Russian original see 33-717. Distribution limited to U.S. Government agencies only.  
Khokhlov, G.P.  
Sea ice, Ice electrical properties, Ice salinity, Ice temperature, Microwaves.
- 33-2644**  
Fine electrical structure of the upper layers of drift ice.  
Bogorodskii, V.V., et al, *U.S. Army Cold Regions Research and Engineering Laboratory*, Jan. 1979, TL 702, Physical characteristics of geophysical processes in polar regions, edited by V.V. Bogorodskii and A.V. Gusev, p.19-26, ADB-033 914, 4 refs. For Russian original see 33-718. Distribution limited to U.S. Government agencies only.  
Khokhlov, G.P.  
Sea ice, Ice electrical properties, Ice dielectrics, Ice salinity, Ice crystal structure.
- 33-2645**  
Principal characteristics of the vertical electrical structure of the upper layers of Arctic drift ice in the UHF range.  
Bogorodskii, V.V., et al, *U.S. Army Cold Regions Research and Engineering Laboratory*, Jan. 1979, TL 702, Physical characteristics of geophysical processes in polar regions, edited by V.V. Bogorodskii and A.V. Gusev, p.27-35, ADB-033 914, 11 refs. For Russian original see 33-719. Distribution limited to U.S. Government agencies only.  
Khokhlov, G.P.  
Sea ice, Ice dielectrics, Ice electrical properties, Ice crystal structure.

- 33-2646**  
Side and normal waves in pulsed electromagnetic sounding of sea ice.  
Bogorodskii, V.V., et al, *U.S. Army Cold Regions Research and Engineering Laboratory*, Jan. 1979, TL 702, Physical characteristics of geophysical processes in polar regions, edited by V.V. Bogorodskii and A.V. Gusev, p.36-39, ADB-033 914, 2 refs. For Russian original see 33-721. Distribution limited to U.S. Government agencies only.  
Tripol'nikov, V.P.  
Sea ice, Electromagnetic prospecting, Scattering.
- 33-2647**  
Experimental study of wave propagation in pulsed radio sounding of stratified media using considerable separation of the receiving and emitting points compared to the layer thickness.  
Bogorodskii, V.V., et al, *U.S. Army Cold Regions Research and Engineering Laboratory*, Jan. 1979, TL 702, Physical characteristics of geophysical processes in polar regions, edited by V.V. Bogorodskii and A.V. Gusev, p.40-48, ADB-033 914, 5 refs. For Russian original see 33-724. Distribution limited to U.S. Government agencies only.  
Trepov, G.V.  
Radio echo soundings, Glacier ice, Ice dielectrics.
- 33-2648**  
Laser study of the optical properties of snow.  
Bogorodskii, V.V., et al, *U.S. Army Cold Regions Research and Engineering Laboratory*, Jan. 1979, TL 702, Physical characteristics of geophysical processes in polar regions, edited by V.V. Bogorodskii and A.V. Gusev, p.49-54, ADB-033 914, 6 refs. For Russian original see 33-725. Distribution limited to U.S. Government agencies only.  
Kropotkin, M.A.  
Snow optics, Lasers.
- 33-2649**  
Space-time variability of the temperature of the upper layer of the Arctic Ocean.  
Bogorodskii, A.V., et al, *U.S. Army Cold Regions Research and Engineering Laboratory*, Jan. 1979, TL 702, Physical characteristics of geophysical processes in polar regions, edited by V.V. Bogorodskii and A.V. Gusev, p.55-58, ADB-033 914, Distribution limited to U.S. Government agencies only.  
Gavrilo, V.P., Gusev, A.V., Fedorinchik, L.F.  
Water temperature, Temperature variations, Temperature gradients, Ice cover effect.
- 33-2650**  
Acoustic emission as an indicator of the process of deformation and break-up of ice.  
Gavrilo, V.P., et al, *U.S. Army Cold Regions Research and Engineering Laboratory*, Jan. 1979, TL 702, Physical characteristics of geophysical processes in polar regions, edited by V.V. Bogorodskii and A.V. Gusev, p.59-68, ADB-033 914, 13 refs. For Russian original see 33-731. Distribution limited to U.S. Government agencies only.  
Gusev, A.V., Zaretskii, I.U.K., Fish, A.M.  
Noise (sound), Ice acoustics, Ice break-up, Ice deformation.
- 33-2651**  
Infrared method of evaluating the effect of cloud cover on the surface temperature of sea ice.  
Bogorodskii, V.V., et al, *U.S. Army Cold Regions Research and Engineering Laboratory*, Jan. 1979, TL 702, Physical characteristics of geophysical processes in polar regions, edited by V.V. Bogorodskii and A.V. Gusev, p.69-77, ADB-033 914, 2 refs. Distribution limited to U.S. Government agencies only.  
Paramonov, A.I.  
Sea ice, Ice temperature, Temperature variations, Cloud cover, Infrared radiation.
- 33-2652**  
Instrument studies of the submerged parts of icebergs in the Southern Ocean.  
Bogorodskii, A.V., et al, *U.S. Army Cold Regions Research and Engineering Laboratory*, Jan. 1979, TL 702, Physical characteristics of geophysical processes in polar regions, edited by V.V. Bogorodskii and A.V. Gusev, p.78-82, ADB-033 914, 1 ref. For Russian original see 33-732 (F-20654). Distribution limited to U.S. Government agencies only.  
Popov, I.K.  
Icebergs, Underwater ice, Ice bottom surface, Side looking radar.  
Side-looking radar is successfully used to study the underside of icebergs. Results of these investigations into the extent of immersion of medium sized icebergs are analyzed.
- 33-2653**  
Botanical observations in Alaska.  
Andreev, V.N., *U.S. Army Cold Regions Research and Engineering Laboratory*, Jan. 1979, TL 698, 29p., ADB-033 241, 14 refs. Translation of Botanicheskii zhurnal 63(1): 115-128, 1978. Distribution limited to U.S. Government agencies only.  
Research projects, Plants (botany), Tundra vegetation, Trees (plants).  
A 15-day visit to Alaska by a Soviet botanist is reported. The 1975 visit was part of the US-USSR exchange on environmental protection and included stops at Palmer, Cantwell, and the University of Alaska in Fairbanks, McKinley Park, Barrow, Bettles, the Seward Peninsula, and several small villages. An account of the main vegetation types of Alaska and comparisons and contrasts with the Soviet tundra and taiga vegetation are given.
- 33-2654**  
Experiment on estimating sea ice area from ice balance components (using the East Greenland ice zone as an example).  
Lebedev, A.A., et al, *U.S. Army Cold Regions Research and Engineering Laboratory*, Jan. 1979, TL 699, 20p., ADB-033 242, 19 refs. For Russian original see 31-1182. Distribution limited to U.S. Government agencies only.  
Uralov, N.S.  
Sea ice, Ice conditions, Drift.  
With data available on the sea ice area at specific times and on the area of ice entering the sea, and removed from it in the interval between these moments, it is not hard to determine the dimensions of the area of ice formed or melted during the same period. Here the term "ice area" means the area of the sea occupied by ice with an undetermined density greater than one. If there are sufficiently great numbers of these estimated areas, then, having established the relationship between them and the hydrometeorological factors governing them, it is possible to estimate the sea ice area from its component elements. In this study this method of estimating ice area is applied to the entire region of East Greenland ice south of 80N.
- 33-2655**  
Thermal regime of reservoirs.  
Rossinskii, K.I., *U.S. Army Cold Regions Research and Engineering Laboratory*, Jan. 1979, TL 700, 224p., ADB-034 526, 98 refs. For Russian original see 30-1829. Distribution limited to U.S. Government agencies only.  
Reservoirs, Thermal regime, Flow rate, Water flow, Heat transfer, Ice temperature.  
The present book considers laws governing the creation and variation of thermal conditions in large river storage basins at different seasons of the year. Heat exchange between the water masses and the surrounding space, as well as heat transport in an aquatic medium, are studied, and the effect of the size of the reservoirs and rate of water flow on water temperature is investigated. The theory of the thermal conditions of inland bodies of water is introduced, and methods and formulas for computing the water temperature in reservoirs is made. Many examples using material drawn from studies of the thermal conditions of reservoirs are presented.
- 33-2656**  
Interpreting the results of temperature gradient measurements in the bottom layer of water in Lake Bol'shoie Toko.  
Efimov, A.V., *U.S. Army Cold Regions Research and Engineering Laboratory*, Jan. 1979, TL 693, 15p., ADB-033 479, For Russian original see 32-343. 5 refs. Distribution limited to U.S. government agencies only.  
Temperature gradients, Probes, Thermal measurements, Ocean bottom.  
In view of the great labor consumption and high cost of drilling operations under sea conditions, a detailed study of the thermal regime of the shelf by the borehole methods appears to have low probability. The so-called marine geothermal studies can be used here. Their essence consists in measuring the temperature gradient by a thermal probe introduced into the first few meters of the bottom and separate determination of the coefficient of thermal conductivity of the ground. Thus it is possible to determine the surface thermal flux through the bottom of the body of water.
- 33-2657**  
Microrelief of the bottom surface of drifting sea ice.  
Grishchenko, V.D., *U.S. Army Cold Regions Research and Engineering Laboratory*, Jan. 1979, TL 694, 6p., ADB-033 100, For Russian original see 31-1197. 2 refs. Distribution limited to U.S. Government agencies only.  
Ice bottom surface, Microrelief, Sea ice.  
Scuba divers on one of the North Pole drifting ice stations examined the bottom surfaces of annual and multi-year sea ice. The bottom of young and annual ice is smooth in the early spring. During summer melting, depressions form and grow on the bottom because of inclusions in the ice, meltwater pools on the top surface, and phytoplankton accumulations, all of which allow increased penetration of radiation. By early fall depressions may be 2-12 cm or more in diameter and 5-10 cm deep. During winter new ice growth fills in the depressions and the bottom surface becomes smooth again, although large irregularities may retain their shapes.
- 33-2658**  
River boat guiding in ice navigation.  
Tronin, V.A., et al, *U.S. Army Cold Regions Research and Engineering Laboratory*, Jan. 1979, TL 695, 123p., ADB-033 240, 32 refs. For Russian original see 28-274. Distribution limited to U.S. Government agencies only.  
Pushkarev, L.A.  
River ice, Ice navigation, Ice conditions, Ice breaking.  
This book summarizes experience operating river icebreakers and transports in ice. A classification of forms of river ice is given; and the behavior of ice in rivers and reservoirs is briefly described. The book describes river icebreakers and transports adapted to navigate in ice, reviews questions of preparation for ice navigation, and considers ways to guide icebreakers in different ice conditions and during the performance of certain icebreaking jobs. Recommendations are given for navigators sailing through ice on their own, and principles are set forth for the organization and execution of icebreaker pilotage.
- 33-2659**  
Observations on vertical profiles of the snow cover on roofs and melt at the bottom of the snow cover.  
Nakamura, T., et al, *U.S. Army Cold Regions Research and Engineering Laboratory*, Jan. 1979, TL 697, 19p., ADB-063 109, 4 refs. For Japanese original see 33-548.  
Abe, O.  
Snow loads, Roofs, Snow melting.  
Observations on vertical profiles of the snow cover on nearly flat roofs of three different buildings were made, and the observational results were compared with that of the snow cover on the ground. Comparison of these four results revealed that the layered structure of the snow cover on flat roofs is similar to the upper part of the snow cover on the ground, and a granular snow layer was observed at the bottom of each snow cover. This means that each snow cover melts at the bottom due to the heat flow either through the ceilings of the buildings or through the ground surface.
- 33-2660**  
Ust'-Oda-Kuytun physiographic province as an example of interaction between natural complexes and the industrial structure of territories. (Ust'-Ordynskaya-Kultunskaya fiziko-geograficheskaya provintsia kak primer vzaimodel'stviia prirodnogo kompleksa s proizvodstvenno-territorial'noi strukturoi).  
Boiarkin, V.M., *Geografiia iuga Vostochnoi Sibiri* (Geography of the south of East Siberia), Irkutsk, 1973, p.5-29, In Russian. Refs. p.28-29.  
DLC GB325.G383  
Taiga soils, Landscape types, Taiga vegetation, Steppes, Permafrost distribution, Discontinuous permafrost, Seasonal freeze thaw, Plant ecology, Snow cover effect, USSR—Irkutsk.
- 33-2661**  
Formation of natural complexes in the central Angara River area. (Osobennosti formirovaniia prirodnkh kompleksov v ralonakh srednego Priangariia).  
Naumova, A.M., *Geografiia iuga Vostochnoi Sibiri* (Geography of the south of East Siberia), Irkutsk, 1973, p.30-33, In Russian. 1 ref.  
DLC GB325.G383  
Swamps, Permafrost distribution, Permafrost hydrology, Peat, Mooses, Active layer thickness, Permafrost depth, Plant ecology, Ecosystems, USSR—Angara River.
- 33-2662**  
Vertical differentiation and the zonal nature of sporadic forest-steppe landscapes in the Angara River area. (Vertikal'naia differentsiatsiia i zonal'naia priroda landshaftov ostrovnykh lesostepel Priangariia).  
Filippova, S.A., *Geografiia iuga Vostochnoi Sibiri* (Geography of the south of East Siberia), Irkutsk, 1973, p.34-42, In Russian. 8 refs.  
DLC GB325.G383  
Permafrost distribution, Sporadic permafrost, Landscape types, Taiga vegetation, Steppes, Cryogenic processes, Plant ecology, Ecosystems, Topographic factors, USSR—Angara River.
- 33-2663**  
Relationship between the cryolithozone and the radioactivity of surface crustal layers. (K voprosu vzaimosviazi kriolitozony s radioaktivnost'iu poverkhnostnykh sloev zemnoi kory).  
Solopov, S.G., *Geografiia iuga Vostochnoi Sibiri* (Geography of the south of East Siberia), Irkutsk, 1973, p.131-132, In Russian. 3 refs.  
DLC GB325.G383  
Earth crust, Radioactivity, Permafrost distribution, Radiation measuring instruments, Gamma irradiation, Aerial surveys.

- 33-2664  
Peculiarities of presenting basic landscape components of northern Transbaikalia on large-scale topographic maps. (Osobennosti otobrazheniya osnovnykh komponentov prirodnykh landshaftov Severnogo Zabaikalia na krupnomasshtabnykh topograficheskikh kartakh). Plastinin, L.A., *Geografiya iuga Vostochnoi Sibiri* (Geography of the south of East Siberia), Irkutsk, 1973, p.133-138, In Russian.  
DLC GB325.G383
- Topographic maps, Alpine land forms, Glacial features, Landscape types, Taiga vegetation, Slope processes, Solifluction, Permafrost distribution, Cryogenic relief, Mapping, USSR—Transbaikalia.
- 33-2665  
Ground water characteristics in different geographic zones of West Siberia. (Osobennosti podzemnykh vod po geograficheskim zonam Zapadnoi Sibiri). Belom, S.G., *Geografiya Sibiri v usloviakh nauchno-tekhnicheskogo progressa* (Geography of Siberia in the light of scientific and technological progress) edited by V.M. Shirokov, Novosibirsk, Nauka, 1975, p.5-18, In Russian. 15 refs.  
DLC GB325.G385
- Alpine land forms, Plains, Swamps, Tundra, Forest tundra, Snow cover distribution, Snow water equivalent, Runoff, Ground water, Water table, Permafrost hydrology, Taliks.
- 33-2666  
Changes in natural environment of the shore zone after construction of the Krashoyarsk and Novosibirsk reservoirs. (Izmeneniya prirodnykh uslovii v pribrezhnoi zone posle sozdaniia Krasnoyarskogo i Novosibirskogo vodokhranilishch). Kuskovskii, V.S., et al, *Geografiya Sibiri v usloviakh nauchno-tekhnicheskogo progressa* (Geography of Siberia in the light of scientific and technological progress) edited by V.M. Shirokov, Novosibirsk, Nauka, 1975, p.35-48, In Russian. 18 refs.  
Podlipskii, I.U.I., Rybka, V.G., Savkin, V.M.  
DLC GB325.G385
- Hydroelectric power generation, Reservoirs, Ice conditions, Shoreline modification, Shore erosion, Slope processes, USSR—Yenisey River, USSR—Ob' River.
- 33-2667  
Interaction between natural environment and Siberian reservoirs with regulated flow. (Vzaimodelstviya prirodnykh uslovii i zaregulirovannykh vod posle sozdaniia sibirskikh vodokhranilishch). Shirokov, V.M., *Geografiya Sibiri v usloviakh nauchno-tekhnicheskogo progressa* (Geography of Siberia in the light of scientific and technological progress) edited by V.M. Shirokov, Novosibirsk, Nauka, 1975, p.82-96, In Russian. 20 refs.  
DLC GB325.G385
- Hydroelectric power generation, Reservoirs, Ice conditions, Icebound lakes, Ice jams, Taiga soils, Taiga vegetation.
- 33-2668  
Raising the level of technical servicing and repair of machines at construction sites of the Baykal Amur railroad. (Vyshe uroven' tekhnicheskogo obsluzhivaniia i tekushchego remonta mashin na BAMe). Khalkis, L.B., *Mekhanizatsiia stroitel'stva*, Jan. 1978, No.1, p.12-15, In Russian.
- Motor vehicles, Construction equipment, Winter maintenance, Earthwork, Excavating equipment, Baykal Amur railroad.
- 33-2669  
Problems of construction companies concerning increased effectiveness of frozen ground excavation. (Zadachi stroitel'nykh organizatsii po povysheniiu effektivnosti razrabotki merzlykh gruntov). Moiseev, P.I., *Mekhanizatsiia stroitel'stva*, July 1978, No.7, p.3-6, In Russian.
- Earthwork, Frozen ground, Excavating equipment, Construction costs.
- 33-2670  
Experience and methods of frozen and hard rock excavation at the establishments of the Ministry of Construction of Heavy Industry, USSR. (Opyt i metody razrabotki merzlykh i skal'nykh gruntov na ob'ektakh Ministrazhstroia SSSR). Barsov, I.P., *Mekhanizatsiia stroitel'stva*, July 1978, No.7, p.6-8, In Russian.
- Earthwork, Excavating equipment, Frozen ground.
- 33-2671  
Experience and methods of frozen and hard rock excavation in power engineering. (Opyt i metody razrabotki merzlykh i skal'nykh gruntov v energeticheskoi stroitel'stve). Moroz, P.K., *Mekhanizatsiia stroitel'stva*, July 1978, No.7, p.8-9, In Russian.
- Electric power plants, Earthwork, Excavating equipment, Frozen ground.
- 33-2672  
Experience and methods of frozen and hard rock excavation in pipeline construction. (Opyt i metody razrabotki merzlykh i skal'nykh gruntov pri stroitel'stve magistral'nykh truboprovodov). Arendt, G.A., *Mekhanizatsiia stroitel'stva*, July 1978, No.7, p.9-11, In Russian.
- Pipelines, Earthwork, Excavating equipment, Frozen ground.
- 33-2673  
Machinery and equipment for frozen ground excavation. (Mashiny i oborudovanie dlia razrabotki merzlykh gruntov). Meshkov, V.M., *Mekhanizatsiia stroitel'stva*, July 1978, No.7, p.24-26, In Russian.
- Earthwork, Excavating equipment, Frozen ground.
- 33-2674  
Screw-drill scraper. (Vintovoi rykhilitel'). Gol'dberg, A.A., et al, *Mekhanizatsiia stroitel'stva*, Dec. 1978, No.12, p.21-22, In Russian.
- Dalaljan, T.G., Sakin, S.A., Chumakov, S.M.
- Earthwork, Drills, Excavating equipment, Frozen ground.
- 33-2675  
Snowstorms and drifting snow in the Altai Mountains. (Meteli i snegozanosimost' v gornom Altai). Reviakin, V.S., et al, *Gliatsiologiya Altaia*, 1976, Vol.11, p.3-32, In Russian. 13 refs.  
Tikhonova, L.L.
- Avalanche engineering, Snow cover distribution, Snowstorms, Snow surveys, Snowdrifts, Snow accumulation, Charts, Wind factors, USSR—Altai Mountains.
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Crude oil was spilled on six of the major Prudhoe Bay plant communities at an intensity of 12 liters/sq m. The communities occurred along a topographic-moisture gradient. The reaction of the major species of the various communities was recorded one year following the spill. Sedges and willows showed substantial recovery from crude oil spills. Mosses, lichens, and most dicotyledons showed little or no recovery. On a very wet plot with standing water, the vegetation showed very poor recovery. *Dryas integrifolia* M. Vahl, the most important vascular species on dry sites, was killed. Identical experiments using diesel oil rather than crude oil showed all species except an aquatic moss to be killed. A sensitivity index for the communities was calculated on the basis of the percentage cover of the resistant species divided by the original total plant cover of the community. With this information an oil spill sensitivity map for an area of Prudhoe Bay was constructed using a vegetation map as a base. Using the crude oil data from Prudhoe Bay together with some from the literature, a predictive sensitivity map was also constructed for an accidental crude oil spill at nearby Franklin Bluffs. In this example all the community types are considered to have moderate to excellent recovery potential.
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Prudhoe Bay crude oil and refined diesel fuel were applied to five topographically distinct tundra soils at Prudhoe Bay, Alaska. The penetration of hydrocarbons into the soil column depended on soil moisture and drainage characteristics. Biodegradation, shown by changes in the pristane to heptadecane and resolvable to total gas chromatographic area ratios, appeared to be greatly restricted in drier tundra soils during one year exposure. Some light hydrocarbons were recovered from soils one year after spillages. Hydrocarbons were still present in soils at Fish Creek, Alaska, contaminated by refined oil spillages 28 years earlier, attesting to the persistence of hydrocarbons in North Slope soils.
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- 33-2802  
Ectomycorrhizal fungi of *Salix rotundifolia* Trautv. I. Impact of surface applied Prudhoe Bay crude oil on mycorrhizal structure and composition.  
Antibus, R.K., et al, *Arctic*, Sep. 1978, 31(3), p.366-380, In English with French summary. 38 refs.  
Linkins, A.E.  
Crude oil, Tundra vegetation, Plants (botany), Fungi, Roots.
- 33-2803  
Ectomycorrhizal fungi of *Salix rotundifolia* Trautv. II. Impact of surface applied Prudhoe Bay crude oil on mycorrhizal root respiration and cold acclimation.  
Linkins, A.E., et al, *Arctic*, Sep. 1978, 31(3), p.381-391, In English with French summary. 46 refs.  
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Crude oil, Tundra vegetation, Roots, Cold tolerance, Biomass.
- 33-2804  
Fungal biomass responses to oil perturbed tundra at Barrow, Alaska.  
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Linkins, A.E., Chmielewski, M.A.  
Crude oil, Tundra vegetation, Environmental impact, Fungi, Biomass.
- 33-2805  
Summary of the workshop on ecological effects of hydrocarbon spills in Alaska.  
Costerton, J.W., et al, *Arctic*, Sep. 1978, 31(3), p.408-411.  
Brunskill, G.J., Hutchinson, T., Widden, P.  
Meetings, Oil spills, Hydrocarbons, Environmental impact.
- 33-2806  
Genesis and classification of Arctic coastal plain soils, Prudhoe Bay, Alaska.  
Parkinson, R.J., Ohio. State University, Columbus. *Institute of Polar Studies. Report*, Nov. 1978, No.68, 147p., Refs. p.63-66.  
Soil surveys, Soil classification, Patterned ground, Soil chemistry.
- 33-2807  
Glaciological field stations, Parts 1 and 2.  
Vivian, R., comp. *Glaciological data*, Feb. 1978, No.4, 227p. (2 vols.). Numerous refs.  
Research projects, Stations, Glaciology.  
Data on nearly 70 field stations, world wide, is given in concise form. Basic information about each station includes: location, accessibility, and access point; research facilities and accommodations, major research interests and duration of programs; data generated and availability; name, address, and telephone number of sponsoring agency.
- 33-2808  
Ice-coring project at Mizuho Station, East Antarctica, 1970-1975.  
Kusunoki, K., ed. Tokyo. *National Institute of Polar Research. Memoirs. Special issue*, Dec. 1978, No.10, 172p., Refs. For individual papers see F-21298 through F-21313 or 33-2809 through 33-2824.  
Suzuki, Y., ed.  
Ice cores, Firn, Depth hoar, Ice crystals, Boreholes, Antarctica—Mizuho Station.  
This volume is an outgrowth of a joint program of ice core drilling at Mizuho Station in East Antarctica by the Japanese Antarctic Research Expedition (JARE) in 1971-1975 and collaborative research on ice analysis done at the drilling site and in home laboratories up to 1978. The volume contains 16 papers: one on drilling technology and operation, eight on the physical and chemical characteristics of retrieved cores, and 7 containing data from the core analysis and borehole logging. Core analysis is still in progress.
- 33-2809  
Outline of the drilling operation at Mizuho Station.  
Suzuki, Y., et al. Tokyo. *National Institute of Polar Research. Memoirs. Special issue*, Dec. 1978, No.10, p.1-24, 21 refs.  
Takizawa, T.  
Ice coring drills, Thermal drills, Ice cores, Antarctica—Mizuho Station.  
Ice drillings were carried out in 1971, 1972 and 1974-75 at Mizuho Station as part of the Glaciological Research Program in Mizuho Plateau of the Japanese Antarctic Research Expedition. Four holes, 41.0 m, 75.0 m, 147.5 m and 145.4 m deep, were drilled and 350 m of cores from them were sent to Japan. The operation is chronologically outlined from the embryo stage of its planning, with emphasis placed on its technical aspects. (Auth.)
- 33-2810  
Stratigraphic analyses of firn and ice at Mizuho Station.  
Watanabe, O., et al. Tokyo. *National Institute of Polar Research. Memoirs. Special issue*, Dec. 1978, No.10, p.25-47, 21 refs.  
Kato, K., Satow, K., Okuhira, F.  
Firn stratification, Ice sheets, Ice cores, Snow accumulation, Ice composition, Oxygen isotopes, Snow density, Antarctica—Mizuho Station.  
Stratigraphy of the 150-m core from Mizuho Station is studied by visual observations as well as by analysis of density and oxygen isotope profiles. Stratigraphic structures are well preserved to a depth of 70 m. Considerably deviated values of density from the average depth-density curve serve as good indicators of the texture of initially deposited snow. From stratigraphic interpretation, about 10.6 g/sq cm is estimated as the mean annual accumulation. With this value the age of the lowermost part of the 150-m core is estimated to be some 1100 years B.P. excluding the periods of hiatus of annual layers. In the delta O-18 profile to the depth of 60 m, the smallest peak indicating the coldest climate is seen at a depth of 32 m which is dated back to some 2000 years B.P. Comparison of the delta O-18 profile in the Mizuho core with that in the Camp Century core indicates that the period of hiatus of annual layers is about one-third of the real duration of the core formation and the mean annual accumulation is about two-thirds of 10.6 g/sq cm at Mizuho Station in the past 300 years. (Auth.)
- 33-2811  
Structural characteristics of firn and ice cores drilled at Mizuho Station, East Antarctica.  
Narita, H., et al. Tokyo. *National Institute of Polar Research. Memoirs. Special issue*, Dec. 1978, No.10, p.48-61, 21 refs.  
Maeno, N., Nakawo, M.  
Firn, Ice cores, Ice crystal size, Ice structure, Structural analysis, Ice crystal structure, Antarctica—Mizuho Station.  
Sizes, shapes and c-axis orientations of crystal grains as well as specific areas of grain boundaries and internal free surfaces were measured for firn and ice core samples of 147.5 m length obtained in 1971 and 1972 at Mizuho Station, East Antarctica. Five critical depths were found at which some structural changes occurred. They were 8 m, 30 m, 55 m, 70 m and 110 m. Their corresponding densities were 550, 730, 840, 855 and 882 kg/cu m, respectively. The densities of 550 and 840 kg/cu m correspond to frequently reported figures at which the densification mechanism changes from mechanical packing of air voids to plastic deformation of ice grains, and from the plastic deformation to shrinkage of closed-off air bubbles. The critical density of 730 kg/cu m (30 m) was first pointed out by Maeno in 1974, who concluded that the bonding between ice grains reached its maximum or optimum state for packing at this density. The present analyses showed that air voids were gathered only at intersections of grain boundaries in the core samples at the critical density. The remaining two critical densities, 855 kg/cu m (70 m) and 882 kg/cu m (110 m), are related to alterations of mechanical stress fields; samples below 70 m contained layers of small grains intermittently, and at depths deeper than 110 m crystal sizes decreased, suggesting the presence of shear components. (Auth.)
- 33-2812  
Measurements of air permeability and elastic modulus of snow and firn drilled at Mizuho Station, East Antarctica.  
Maeno, N., et al. Tokyo. *National Institute of Polar Research. Memoirs. Special issue*, Dec. 1978, No.10, p.62-76, 18 refs.  
Narita, H., Araoka, K.  
Snow elasticity, Snow mechanics, Firn, Antarctica—Mizuho Station.  
Air permeability and elastic modulus were measured for firn samples prepared from a 20-m pit and cores drilled to the depth of 147.5 m at Mizuho Station in East Antarctica. Air permeability decreased and elastic modulus increased with increasing depth or density. Two distinct changes were found to densities of 550 and 730 kg/cu m, i.e. at porosities of 0.40 and 0.20, in the plots of air permeability and elastic modulus against density or porosity. The former change is explained by the alteration of the densification mechanism from mechanical packing to plastic deformation of ice particles, and the latter by the attainment of an optimum configuration of ice bounding for air permeation and mechanical strength. Observed results are compared with the theoretical air permeability of an ideal snow, to which all polar snows are considered to approach in a long aging

period under high hydrostatic pressure and high homologous temperature. It is suggested that the optimum state, which is reached at the density of 730 kg/cu m or the porosity of 0.20, is that of snow in which air channels are mainly located at intersections of grain boundaries and some 30 percent of them are unblocked. (Auth.)

**33-2813**  
**Electrical behaviors of antarctic ice drilled at Mizuho Station, East Antarctica.**

Maeno, N., Tokyo. *National Institute of Polar Research. Memoirs. Special issue, Dec. 1978, No.10, p.77-94, 25 refs.*

**Ice cores, Firn, Ice dielectrics, Ice electrical properties, Antarctica—Mizuho Station.**

The electrical properties of Antarctic firn and ice cores drilled at Mizuho Station to the depth of 145 m were studied in a wide range of frequency (0.1 Hz to 1 MHz) and temperature (0 to -50°C). Remarkable differences were found between the cores taken from depths shallower than 55 m and those from deeper parts. Dielectric properties of the cores above 55 m, corresponding to cores permeable to air flow and with densities less than 840 kg/cu m could be explained as those of heterogeneous mixture-dielectrics of ice and air, though the physical meaning of the activation energies for dielectric relaxation and high-frequency conduction were not clarified completely. Cores deeper than 55 m, corresponding to impermeable cores with densities higher than 840 kg/cu m, showed extremely large dielectric constants and conductivities. Based on the results of the present electrical measurements, the alteration of densification mechanisms was suggested to occur at a depth around 30 m corresponding to the density of 730 kg/cu m, where the bonding and compaction of composing ice particles were regarded to have reached their optimum mode, which was also confirmed by petrographic analyses of cores such as areas of internal free surfaces and grain boundaries.

**33-2814**  
**Stress-strain tests of ice core drilled at Mizuho Station, East Antarctica.**

Shoji, H., Tokyo. *National Institute of Polar Research. Memoirs. Special issue, Dec. 1978, No.10, p.95-101, 7 refs.*

**Ice cores, Ice mechanics, Strain tests, Stresses, Antarctica—Mizuho Station.**

The mechanical properties of an ice sample (No. 143) taken from 100 m depth at Mizuho Station were investigated with stress-strain tests in uniaxial compression at temperatures of -6 and -16°C. Strain rate employed in experiments ranged from 10,000,000 to 1,000,000/s. Stress-strain curves obtained are classified into two types: stress-yield type and stress-saturation type, according to the occurrence and non-occurrence of yield drop due to the internal cracking. The relationships between the maximum stress obtained from the curves and the strain rate (the stress dependence of the strain rate) thus obtained were compared with those for core samples taken at Byrd Station. It was found that the Mizuho core sample resembled Byrd core sample No.145 (300 m depth) in the mechanical property shown in the relationships stated above. Peculiarity in the property exhibited at -16°C experiments is interpreted by the generation of cracks during deformation of high strain rate. (Auth.)

**33-2815**  
**Internal friction of antarctic Mizuho ice cores at low frequency.**

Nakamura, T., et al, Tokyo. *National Institute of Polar Research. Memoirs. Special issue, Dec. 1978, No.10, p.102-113, 8 refs.*

**Ice cores, Shear modulus, Internal friction, Ice mechanics, Antarctica—Mizuho Station.**

Internal friction and shear modulus of Antarctic ice cores drilled at Mizuho Station were measured with an inverted torsion pendulum in a frequency range of 4 to 9 Hz and a temperature range of 96 to 272K. As a function of temperature, the measured internal friction of every core showed two peaks. One around 265K was considered due to the grain boundary and the other around 150K to the mechanical relaxation, because the internal friction of a single crystal has only one peak around 170K corresponding to the latter peak. The height of the former peak decreased with an increase in the density of the core. The shear modulus decreased very slowly with increase of temperature to around 253K, where internal friction begins to increase sharply. The decrease of shear modulus was rapid above that temperature. The shear modulus increased linearly with the density. (Auth.)

**33-2816**  
**Anisotropy of ultrasonic wave velocities in Mizuho cores.**

Yamada, T., Tokyo. *National Institute of Polar Research. Memoirs. Special issue, Dec. 1978, No.10, p.114-123, 13 refs.*

**Snow cover, Ice sheets, Depth hoar, Wave propagation, Anisotropy, Sound waves, Antarctica—Mizuho Station.**

The snow cover at Mizuho Station is characterized by well-developed depth hoar. To clarify how the anisotropy of elastic wave velocities changes with the densification process of the depth hoar having an anisotropic texture, the P- and the S-wave velocities were measured directly as a function of depth for both the vertical and the horizontal direction using the ultrasonic pulse method applied to deep core samples drilled to the depth of 145 m at Mizuho Station. As for the P-wave velocity, the

upper part of the ice sheet from the surface to the depth of 25-30 m (0.72-0.73 Mg/cu m density) was found to be anisotropic, while below that depth the ice sheet became isotropic. The curve of P-wave velocity versus density disclosed discontinuities at the densities of 0.65 and 0.84 Mg/cu m, which correspond to the depths of 10-16 and 55-60 m respectively. The facts indicate that the process of densification and metamorphism of snow and ice may change at these levels in the ice sheet at Mizuho Station. As for the S-wave velocity, the ice sheet was isotropic through all depths, whereas on the curve of S-wave velocity versus density only one discontinuity was clearly noticed, at the density of 0.65 Mg/cu m. (Auth. mod.)

**33-2817**  
**Extinction coefficient of light of cores drilled at Mizuho Station, East Antarctica.**

Kamioka, S., et al, Tokyo. *National Institute of Polar Research. Memoirs. Special issue, Dec. 1978, No.10, p.124-130, 12 refs.*

**Ice cores, Light scattering, Antarctica—Mizuho Station.**

The extinction coefficient of light of shallow ice core samples obtained at Mizuho Station was measured and its dependence on depth from 10 m to 110 m, the density in the range of 350-880 kg/cu m, and specific surface area of grains were investigated. The value of extinction coefficient decreased and asymptotized to a definite value with the increase of depth. (Auth.)

**33-2818**  
**Compiled stratigraphic data from cores drilled at Mizuho Station.**

Narita, H., et al, Tokyo. *National Institute of Polar Research. Memoirs. Special issue, Dec. 1978, No.10, p.132-135.*

**Stratigraphy, Ice cores, Depth hoar, Grain size, Antarctica—Mizuho Station.**

Stratigraphic analyses including layer features, grain sizes and depth hoar levels, were made under the transmitting fluorescent light for snow samples prepared from 20 m pit and drilled cores of JARE-12 and 13. The results of the stratigraphic analyses are given as well as the depths of measurements and names of observers.

**33-2819**  
**Compiled density data from cores drilled at Mizuho Station.**

Narita, H., et al, Tokyo. *National Institute of Polar Research. Memoirs. Special issue, Dec. 1978, No.10, p.136-158.*

**Ice cores, Ice density, Firn, Antarctica—Mizuho Station.**

Details of five separate series of measurements, amounting to a total of 3635 density measurements conducted on Mizuho cores during glaciological studies JARE-11, 12 and 13, are tabulated. The data include source of samples, depth range, remarks, series, average density, and cumulative mass per unit area for 0.5 m increments from the surface to 124 m.

**33-2820**  
**Petrographic data from cores drilled at Mizuho Station.**

Narita, H., Tokyo. *National Institute of Polar Research. Memoirs. Special issue, Dec. 1978, No.10, p.159-164.*

**Ice cores, Firn, Ice crystal size, Ice structure, Grain size, Antarctica—Mizuho Station.**

For the purpose of studying changes in petrographic structures of firn and ice with depth, about 160 vertical thin sections were prepared from JARE-13 cores covering from 23.5 m to 145.5 m in depth, and microphotographs of them were taken under ordinary and polarized light. The photographs and petrographic structures, together with the frequency of size parameter and the fabric pattern are given.

**33-2821**  
**Oxygen isotopic composition in the cores from Mizuho Station.**

Kato, K., Tokyo. *National Institute of Polar Research. Memoirs. Special issue, Dec. 1978, No.10, p.165-166.*

**Ice cores, Ice composition, Oxygen isotopes, Antarctica—Mizuho Station.**

The results of oxygen isotope determinations on the Mizuho cores are given in delta 0-18 notation. The 0-18/0-16 ratio of CO<sub>2</sub> equilibrated isotopically with a water sample was measured with a double collector mass spectrometer.

**33-2822**  
**Compiled data of chemical compositions in ice cores drilled at Mizuho Station.**

Murozumi, M., et al, Tokyo. *National Institute of Polar Research. Memoirs. Special issue, Dec. 1978, No.10, p.167-168.*

**Ice cores, Ice composition, Snow composition, Antarctica—Mizuho Station.**

Data are presented on the concentrations of sodium, magnesium, and mercury in Mizuho cores.

**33-2823**  
**Temperature profile in the drilled hole.**

Fujii, Y., Tokyo. *National Institute of Polar Research. Memoirs. Special issue, Dec. 1978, No.10, p.169.*

**Boreholes, Snow temperature, Ice temperature.**

Temperatures in a borehole drilled to a depth of 147.5 m by JARE-13 in 1972 are tabulated. Measurements were made with a thermistor, and the accuracy of the measurements was 0.02°C.

**33-2824**  
**Inclination of the hole drilled by JARE-13.**

Narita, H., Tokyo. *National Institute of Polar Research. Memoirs. Special issue, Dec. 1978, No.10, p.170-172.*

**Boreholes, Borehole instruments, Snow depth.**

The inclination of the hole drilled by JARE-13 was measured at every 5m down to 135m on Dec. 5, 1972, shortly after the termination of drilling at 147.5m below the snow surface. The measurements are tabulated, and the equipment is described and illustrated.

**33-2825**  
**Catastrophes and resilience of a zero-dimensional climate system with ice-albedo and greenhouse feedback.**

Fraedrich, K., Royal Meteorological Society. *Quarterly journal, Jan. 1979, 105(443), p.147-167, 16 refs.*

**Climate, Ice optics, Albedo, Mathematical models.**

**33-2826**  
**Avalanches and snow safety.**

Fraser, C., New York, Charles Scribner's Sons, 1978, 269p., Refs. p.255-261.

**Accidents, Avalanche countermeasures, Safety, Avalanche formation, Avalanche triggering, Snow accumulation, Rescue operations, Explosion effects.**

**33-2827**  
**Snow torrents: avalanche accidents in the United States 1967-71.**

Williams, K., U.S. Rocky Mountain Forest and Range Experiment Station, Fort Collins, Colorado. *U.S. Forest Service general technical report, Mar. 1975, RM-8, 190p.*

**Avalanche formation, Accidents, Rescue operations, Meteorological factors, Avalanches, Statistical data, United States.**

**33-2828**  
**Thermal conductivity measurements on saturated rocks at permafrost temperatures.**

King, M.S., Canadian journal of earth sciences, Jan. 1979, 16(1), p.73-79, In English with French summary. 9 refs.

**Thermal conductivity, Frozen rocks, Permafrost thermal properties, Frozen ground thermodynamics, Thermal factors, Ice water interface, Soil composition, Saturation.**

**33-2829**  
**Creep instability analysis of the Antarctic and Greenland ice sheets.**

Cary, P.W., et al, Canadian journal of earth sciences, Jan. 1979, 16(1), p.182-188, In English with French summary. 21 refs.

**Ice sheets, Ice creep, Rheology, Shear stress, Heat flux, Heat transfer.**

Creep instability, the runaway increase of temperature and deformation due to internal strain heating, is analyzed with a very simple model of one-dimensional heat transfer to estimate the stability of the antarctic and Greenland ice sheets. Derived stability maps indicate that for the assumed rheology both ice sheets are completely stable; however, the stability of the coastal region of Wilkes Land in Antarctica is only marginal and cannot be accurately determined because of uncertainties in the data, especially basal shear stress. (Auth.)

**33-2830**  
**Rock glacier types and their drainage systems, Grizzly Creek, Yukon Territory.**

Johnson, P.G., Canadian journal of earth sciences, Sep. 1978, 15(9), p.1496-1507, In English with French summary. 10 refs.

**Rock glaciers, Glacial hydrology, Drainage, Glacier movement, Glacier melting, Meltwater.**

**33-2831**  
**Manual for construction foremen and workers laying and ballasting railroad tracks.**

Posobie stroitel'nomu masteru i proizvoditelu rabot po ukladke i ballastirovke puti, Sessarevskii, A.N., et al, Moscow, Transport, 1978, 183p., In Russian with English table of contents enclosed. 14 refs.

**Roadbeds, Embankments, Railroad tracks, Hydraulic structures, Permafrost beneath structures, Cold weather construction, Construction materials, Transportation, Baykal Amur railroad.**

- 33-2832**  
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- 33-2833**  
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- 33-2834**  
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Vicherevin, A.E.  
Railroad tracks, Embankments, Hydraulic structures, Permafrost beneath structures, Dams, Swamps, Drainage, Soil stabilization, Bridges, Culverts, Drains, Baykal Amur railroad.
- 33-2835**  
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Shagimardanov, R.M., Temnikov, V.G., Semenov, M.D.  
Steel structures, Welding, Joints (junctions), Cold weather tests.
- 33-2836**  
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- 33-2837**  
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Soil freezing, Frozen ground, Rheology, Analysis (mathematics).
- 33-2838**  
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- 33-2839**  
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- 33-2840**  
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- 33-2841**  
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- 33-2842**  
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- 33-2843**  
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- 33-2844**  
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- 33-2845**  
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- 33-2846**  
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- 33-2848**  
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- 33-2849**  
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equally as devastating to visibility in the vicinity of the pond. During the winter of 1975-76, suppression tests were continued using films of hexadecanol, mixes of hexadecanol and octadecanol, and ethylene glycol monobutyl ether (EGME). Suppression effectiveness at colder temperatures was studied and limits to the techniques were probed. A reinforcing grid was constructed that prevented breakup of the film by wind and water currents. Lifetime tests indicated that EGME degrades much more slowly than either hexadecanol or the hexadecanol-octadecanol mix. All the films were found to be very effective fog reducers at warmer temperatures but still allowed 20% to 40% of normal evaporation to occur. The vapor thus produced was sufficient to create some ice fog at lower temperatures, but this ice fog occurred less frequently and was more quickly dispersed than the thick fog that was present before application of the films.

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33-2972

**Interaction between floating ice sheets and sloping structures.**

Sørensen, C., *Copenhagen. Polyteknisk laereanstalt. Institute of Hydrodynamics and Hydraulic Engineering. Series paper*, 1978, No.19, 175p., Refs. p.172-175.

**Floating ice, Static loads, Dynamic loads, Offshore structures, Impact strength, Compressive strength, Analysis (mathematics).**

33-2973

**Clay mineralogy and geochemistry of soils and sediments with permafrost in interior Alaska.**

Allan, R.J., Hanover, N.H., Dartmouth College, June 1969, 289p., University Microfilms order No.69-21,223, Ph.D. thesis. Refs. p.276-289.

**Permafrost structure, Clay minerals, Geochemistry, Frozen ground chemistry, Sediments, Frozen ground analysis, Arctic vegetation.**

33-2974

**Development of an operational northern aquatic ecosystem model.**

Carlson, R.F., et al, *Alaska. University. Institute of Water Resources. Report*, June 1977, IWR-82, 15p.

**PB-288 310. Fox, P.M., LaPerriere, J.D. Ecosystems, Limnology, Mathematical models, Water supply, Economic development.**

33-2975

**Wetted salt process for improved snow and ice control.**

Washington, D.C., Public Technology, Inc., 1977, 28p. PB-287 753.

**Ice control, Chemical ice prevention, Snow removal, Solutions.**

33-2976

**Report of the International Ice Patrol in the north Atlantic Ocean, season of 1974.**

Super, A.D., et al, *U.S. Coast Guard. Report*, May 1978, USCG-Bull-60, 67p. ADA-055 267.

**Crowell, D.W. Ice conditions, Ice reporting, Aerial reconnaissance, Sea ice.**

33-2977

**Communication in the work place: an ecological perspective.**

Ledbetter, C.B., *U.S. Army Cold Regions Research and Engineering Laboratory*, Feb. 1979, SR 79-3, 19p., ADA-066 322, 30 refs.

**Cold weather construction, Data transmission, Human factors, Environments.**

Patterns of communication and social interaction within a work organization are significantly influenced by architecture. Nearly all work organizations are dependent upon information flow, both informal and formal, between coworkers. As a rule, the more open and informal the communication, the more productively and efficiently the organization operates. The architectural design concept of focal points is presented as a strategy for planning the work facility for improved informal communication. Examples of energy-efficient building design schemes for cold regions are presented. These prototype buildings combine design for improved worker efficiency with thermal efficiency.

33-2978

**Environmental inventories Antarctic area.**

U.S. National Oceanic and Atmospheric Administration. Environmental Data and Information Service, Washington, D.C., 1978, 24p. PB-289 763.

**Aerial photography, Glaciology.**

This publication is the first in a newly established series of publications from the National Oceanic and Atmospheric Administration's Environmental Data Service. Its purpose is to show in an easily understandable form the various types of

environmental data available from EDS. The inventory illustrates in graphic form the types and amounts of data available from EDS for specific geographic regions. For this issue the Antarctic was chosen. Future issues will cover the Arctic, Mediterranean Sea, and tropical oceans of the world (four areas in all).

33-2979

**Development of a microwave radiometer for use as a highway ice detector.**

Berinsky, S., et al, *U.S. Federal Highway Administration. Report*, Sep. 1978, FHWA-RD-78-203, 144p.

**Hong, H.K., Lee, T.H., Schrader, W.T. Ice detection, Roads, Measuring instruments, Microwaves, Radiometry, Bridges.**

33-2980

**Detection of preferential icing on bridges, using traffic and meteorological data.**

Eldon, J.A., *U.S. Federal Highway Administration. Report*, Sep. 1978, FHWA-RD-78-134, 103p., 17 refs.

**Ice detection, Bridges, Ice forecasting, Meteorological data.**

33-2981

**Climatonomical modeling of temperature response to dust contamination of antarctic snow surfaces.**

Lettau, H.H., *Boundary-layer meteorology*, 1977, No.12, p.213-229, 10 refs.

**Climate, Mathematical models, Albedo, Snow surface temperature, Heat transfer, Snow air interface, Antarctica—South Pole.**

Monthly averages of the surface energy balance are parameterized, resulting in a reduced solar forcing function and a nondimensional time scale for computing the thermal response at the air-snow interface by numerical forward integration. The climatonomical transform of the balance equation assesses surface-temperature perturbations resulting from parameter modifications that simulate effects of dust contamination of a snow surface. Three climatonomical model experiments permit these conclusions: 1) an albedo reduction increases primarily the summer temperatures; 2) an emissivity decrease raises the temperature of all months nearly uniformly; and 3) the thermally induced feedback on submedium structure (if summer melting is initiated) increases the storage capacity and reduces spring and summer temperatures with compensating rise in autumn and winter temperature. Quantitative results are exemplified by assumed modification of conditions that exist at the South Polar Plateau. (Auth.)

33-2982

**Sintering and compaction of snow containing liquid water.**

Colbeck, S.C., et al, *Philosophical magazine A*, Jan. 1978, 39(1), MP 1190, p.13-32, Refs. p.31-32.

**Snow compaction, Snow mechanics, Firnification, Ice density, Salinity, Meltwater, Wet snow.**

33-2983

**Urban planning and construction in the Kola North (Part 2).**

Makhrovskaya, A.V., et al, *Polar geography*, Oct.-Dec. 1977, 1(4), p.286-306, For Part 1 see 32-1365.

**Valtens, M.E., Panov, L.K., Belinskii, A.I.U. Economic development, Urban planning, Environmental protection, Transportation, Buildings, Roads, USSR—Kola Peninsula.**

33-2984

**Pilot tests of satellite snowcover/runoff forecasting systems.**

Rango, A., *U.S. National Aeronautics and Space Administration. Technical memorandum*, Mar. 1978, No.78109, 13p., N78-20577, 12 refs.

**Snow cover distribution, Runoff forecasting, Remote sensing, Spacecraft, Mapping, Landsat.**

33-2985

**Solid waste disposal by landspreading techniques.**

Durlak, E.R., *U.S. Naval Construction Battalion Center, Port Hueneme, Calif. Civil Engineering Laboratory. Technical note*, Feb. 1977, CEL-TN-1471, 74p.

**ADB-017 149. Waste disposal, Sludges, Land reclamation.**

Landspreading is the disposal of solid waste by mixing compostable materials into the topsoil so that the decomposition process remains aerobic. Some of the advantages for landspreading include minimum settling of the land, no formation of undesirable odors or leachates, a potential for the support of vegetation, continued usefulness of the land, restoration in a minimum amount of time, and improvement in soil texture and water retention. Construction industry rototillers were selected as the most likely candidates for successfully homogenizing solid waste into the topsoil to depths up to 20 inches. Three types of these machines in two types of soil were studied, as well as the agricultural, chemical, and biological aspects of the process.

- 33-2986**  
Effects of sludge application on soil water and vegetation in a northern hardwood forest in New England. Koterba, M.T., et al, *New Hampshire University. Water Resources Research Center. Report*, June 1977, WRR-15, 37p. PB-273 768.  
Hornbeck, J.W., Pierce, R.S.  
Waste disposal, Vegetation, Forests, Sewage treatment, Sludges.
- 33-2987**  
Survey of icing conditions for marine gas turbines. Swan, K.T., *U.S. Naval Air Propulsion Test Center. Report*, Sep. 1977, NAPT-PE-114, 70p. ADA-045 558.  
Ships, Icing, Turbines.
- 33-2988**  
Gravel removal studies in selected Arctic and subarctic streams in Alaska. Woodward-Clyde Consultants, San Francisco, 1976, 134p. PB-272 991.  
Streams, Gravel, Environmental impact, United States-Alaska.
- 33-2989**  
State-of-the-art survey and economic comparison of freezing processes. Johnson, W.E., Dec. 1976, 75p., For another version see 33-745.  
Desalting, Artificial freezing, Water supply, Economic analysis.
- 33-2990**  
Comparative economics of freezing processes as brine concentrators. Schroeder, P.J., et al, Irvine, Calif., Fluor Engineers and Constructors, Inc., 1977, 96p. PB-273 318.  
Khan, A.R., Mulford, S.F.  
Artificial freezing, Desalting, Brines, Water pollution, Economic analysis.
- 33-2991**  
Evaluation of commercial antifreezes. Conley, J.H., et al, *U.S. Army Mobility Equipment Research and Development Command. Report*, May 1978, MERADCOM-2248, 12p. ADA-060 848.  
Jamison, R.G.  
Corrosion, Antifreezes, Vehicles.
- 33-2992**  
Snowmapping in southern Norway by use of LANDSAT imagery. Odegaard, H., et al, *U.S. National Aeronautics and Space Administration. Contractor report*, May 1977, NASA-CR-155031, 30p. E77-10241.  
Skorve, J.  
Snow cover distribution, Snow line, Mapping.
- 33-2993**  
Final EIS/EIR Las Virgenes-Triunfo Malibu-Topanga area wide facilities plan. U.S. Environmental Protection Agency, Region 9, San Francisco, Calif., 1977, 477p., PB-273 524, See also 33-2994.  
Waste disposal, Waste treatment, Water treatment, Irrigation, Sewage treatment, Sewage disposal.
- 33-2994**  
Final EIS/EIR Las Virgenes-Triunfo Malibu-Topanga area wide facilities plan. Volume 2. Appendices. U.S. Environmental Protection Agency, Region 9, San Francisco, Calif., 1976, 583p., PB-273 525, See also 33-2993.  
Environmental impact, Sewage treatment, Sewage disposal, Irrigation.
- 33-2995**  
Ice fog (a bibliography with abstracts). Brown, R.J., comp, Springfield, Va., National Technical Information Service, 1977, 62p., NTIS/PS-77/1014, Covers the period from 1974 through Oct. 1977.  
Bibliographies, Ice fog.
- 33-2996**  
Some results from a joint Swedish-Finnish sea ice experiment, March 1977. Onstedt, A., et al, *Sweden. Meteorologiska och hydrologiska institutet. SMHI rapporter*, 1978, No. RMK 10, c50 leaves, In English with Swedish summary. 4 refs.  
Sahlberg, J.  
Sea ice, Drift, Wind velocity, Wind direction, Ocean currents, Models.
- 33-2997**  
Grain coarsening of ice particles immersed in pure water. Tushima, K., *Seppyo*, Dec. 1978, 40(4), p.1-11, In Japanese with English summary. 16 refs.  
Ice structure, Boundary value problems, Mass transfer.
- 33-2998**  
Measurement of falling velocity of snow using a laser Doppler velocimeter. Abe, T., et al, *Seppyo*, Dec. 1978, 40(4), p.12-15, In Japanese with English summary. 4 refs.  
Sasaki, O.  
Snowfall, Velocity measurement, Measuring instruments.
- 33-2999**  
On the power required for driving the blower of a rotary type snow removal machine. Kuriyama, H., et al, *Seppyo*, Dec. 1978, 40(4), p.16-23, In Japanese with English summary. 9 refs.  
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Snow removal equipment, Engines.
- 33-3000**  
Cost evaluation study of snow removal by heating system in a city in Japan. Oshima, M., *Seppyo*, Dec. 1978, 40(4), p.24-36, In Japanese with English summary. 11 refs.  
Snow removal, Heating, Water pipelines, Cost analysis.
- 33-3001**  
Roadside planting of snow break trees. Saito, S., *Seppyo*, Dec. 1978, 40(4), p.37-43, In Japanese. 23 refs.  
Trees (plants), Snowdrifts, Roads.
- 33-3002**  
Workshop and two tutorial seminars in Zvenigorod, February 1978. [Rabochee soveshchanie i dve shkolyseminara v Zvenigorode v fevrale 1978 goda]. Voloshina, A.P., et al, *Akademiia nauk SSSR. Institut geografi. Materialy glatsiologicheskikh issledovanii. Khronika obsuzhdeniia*, 1978, No.33, p.5-28, In Russian.  
Glaciology, Research projects, Meetings.  
Comprehensive information is given on three seminars. Work done in the Arctic, the Antarctic and mountains of middle latitude is discussed separately for each sponsoring institution.
- 33-3003**  
Resolutions of a Workshop of the Glaciological Section, Feb. 1978. [Rezoliutsiia Rabochego soveshchaniiia Sektii glatsiologii, fevral' 1978 g.]. *Akademiia nauk SSSR. Institut geografi. Materialy glatsiologicheskikh issledovanii. Khronika obsuzhdeniia*, 1978, No.33, p.28-31, In Russian.  
Glaciology, Research projects, Meetings.  
Activities and accomplishments of institutions in glaciological research in the Arctic and Antarctic for 1977 are described. The workshop also developed the program for 1978, which includes plans to increase efforts in paleoglaciological studies in the Antarctic, as well as continued work on the new Antarctic atlas.
- 33-3004**  
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Lugovskaia, E.A.  
Naleds, Glaciology, Meetings, Research projects, Icing.
- 33-3005**  
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Ice crystals, Ice composition, Ice physics, Meetings, Glaciology.  
A total of 58 papers based on ice crystal studies in the Antarctic were presented at the Symposium on Physics and Chemistry of Ice at Cambridge, England, Sep. 10-24, 1977. Studies carried out by the Soviet Union, U.S.A., Australia, Japan and England were concerned with ice crystal structure and its deformation due to temperature variations and pressure. The IAGP meeting took place with the participation of Australia, England, the Soviet Union, the United States and France. Reports of work done in 1976/77 and plans for future research were presented; the latter concerned routes for radio sounding of ice, locations for deep drilling, and traverses for general glaciological and geophysical surveys. Summaries of the papers are given.
- 33-3006**  
Regional seminar on ice, snow and avalanches in India, March 1978. [Regional'nyi uchebnyi seminar po l'du, snegu i lavinam v Indii v marte 1978 g.]. Losev, K.S., *Akademiia nauk SSSR. Institut geografi. Materialy glatsiologicheskikh issledovanii. Khronika obsuzhdeniia*, 1978, No.33, p.41-42, In Russian.  
Ice surveys, Avalanches, Snow hydrology, Mountains.
- 33-3007**  
Detection of surging glaciers using aerial photography and LANDSAT imagery. [Obnaruzhenie pul'siruiushchikh lednikov s pomoshch'iu aerofotos'emi i snimkov so sputnika Landsat]. Krimmel, R.M., *Akademiia nauk SSSR. Institut geografi. Materialy glatsiologicheskikh issledovanii. Khronika obsuzhdeniia*, 1978, No.33, p.43-46, 141-133, In Russian and English. 3 refs. Discussion p.121,181.  
Glacier surges, Remote sensing, Aerial photographs, LANDSAT.
- 33-3008**  
Identification of unstable glaciers intermediate between normal and surging glaciers. [Identifikatsiia neustoiichivkh lednikov, promezhutochnykh mezhdu normal'nymi i pul'siruiushchimi lednikami]. Mayo, L.R., *Akademiia nauk SSSR. Institut geografi. Materialy glatsiologicheskikh issledovanii. Khronika obsuzhdeniia*, 1978, No.33, p.47-55, 133-135, In Russian and English. 5 refs. Discussion p.121-122, 182-183.  
Glacier oscillation, Remote sensing, LANDSAT, Aerial photographs, Classifications.
- 33-3009**  
Identification of surging glaciers by morphometric characteristics. [Identifikatsiia pul'siruiushchikh lednikov po morfometricheskim kharakteristikam]. Glazyrin, G.E., *Akademiia nauk SSSR. Institut geografi. Materialy glatsiologicheskikh issledovanii. Khronika obsuzhdeniia*, 1978, No.33, p.55-58, 136-138, In Russian and English. 10 refs. Discussion p.122-123, 183-184.  
Glacier surges, Glacial features, Glacier surfaces.
- 33-3010**  
Summary of research on a surge-type glacier in Alaska. [Itogi issledovanii odnogo iz pul'siruiushchikh lednikov Alaski]. Bindschadler, R., et al, *Akademiia nauk SSSR. Institut geografi. Materialy glatsiologicheskikh issledovanii. Khronika obsuzhdeniia*, 1978, No.33, p.58-63, 138-142, In Russian and English. 31 refs.  
Harrison, W., Raymond, C.  
Glacier surges, Ice temperature, Glacier surfaces, Glacier flow, Glacier mass balance, Analysis (mathematics).
- 33-3011**  
Oscillations of the Obruchev Glacier (polar Urals) in 1953-1974. [Kolebaniia lednika Obrucheva (polarnyi Ural) v 1953-1974 g.]. Shumskii, P.A., et al, *Akademiia nauk SSSR. Institut geografi. Materialy glatsiologicheskikh issledovanii. Khronika obsuzhdeniia*, 1978, No.33, p.64-70, 142-147, In Russian and English. 4 refs.  
Krass, M.S.  
Glacier oscillation, Observation, Analysis (mathematics).
- 33-3012**  
Study of the mechanism of mountain glacier oscillation. [Izuchenie mekhanizma kolebaniu gornykh lednikov]. Makarevich, K.G., et al, *Akademiia nauk SSSR. Institut geografi. Materialy glatsiologicheskikh issledovanii. Khronika obsuzhdeniia*, 1978, No.33, p.70-74, 148-150, In Russian and English. 5 refs.  
Makarevich, A.K.  
Glacier oscillation, Glacier surfaces, Glacier flow, Mountain glaciers, Flow rate.
- 33-3013**  
Oscillation of the Shumskiy Glacier (Dzhungarskiy Alatau) in 1966-1974. [Kolebaniia lednika Shumskogo (Dzhungarskii Alatau) v 1966-1974 gg.]. Shumskii, P.A., et al, *Akademiia nauk SSSR. Institut geografi. Materialy glatsiologicheskikh issledovanii. Khronika obsuzhdeniia*, 1978, No.33, p.75-76, 150-152, In Russian and English. 1 ref. Discussion p.123, 184.  
Krass, M.S., Cherkasov, P.A.  
Glacier oscillation, Ice volume, Glacier mass balance.

- 33-3014**  
Readvance of the Allalin Glacier after the ice avalanche of 1965. (Vosstanovlenie lednika Alalin posle ego obvala v 1965 godu). Röhlsberger, H., et al, *Akademiia nauk SSSR. Institut geografii. Materialy glatsiologicheskikh issledovaniĭ. Khronika obsuzhdeniia*, 1978, No.33, p.77-93, 142-164, In Russian and English. 14 refs. Discussion p.123-124, 184.  
Kasser, P.  
Glacier mass balance, Glacier oscillation.
- 33-3015**  
Role of self-oscillation in the dynamics of glacial systems. (Rol' avtokolebaniĭ v dinamike lednikovyykh sistem). Rototaev, K.P., *Akademiia nauk SSSR. Institut geografii. Materialy glatsiologicheskikh issledovaniĭ. Khronika obsuzhdeniia*, 1978, No.33, p.93-103, 164-168, In Russian and English. Discussion p.124, 184.  
Glacier oscillation, Glacial features, Dynamic properties, Climatic factors.
- 33-3016**  
Surges of Spitsbergen glaciers as features related to climate. (Podvizhki lednikov Shpitsbergena kak klimaticheski obuslovlennoe iavlenie). Baranowski, S., *Akademiia nauk SSSR. Institut geografii. Materialy glatsiologicheskikh issledovaniĭ. Khronika obsuzhdeniia*, 1978, No.33, p.103-106, 168-170, In Russian and English. 18 refs. Discussion p.124, 184-185.  
Glacier surges, Climatic changes, Glacier mass balance, Glacial features, Ice plasticity, Ice deformation.
- 33-3017**  
Thickening of the Khumbu Glacier flowing from Mt. Everest, East Nepal. (Utolshchenie lednika Kkhumbu, stekaiushchego s gory Everest (Vostochnyi Nepal)). Higuchi, K., et al, *Akademiia nauk SSSR. Institut geografii. Materialy glatsiologicheskikh issledovaniĭ. Khronika obsuzhdeniia*, 1978, No.33, p.107-112, 171-175, In Russian and English. 10 refs.  
Mae, S., Kodama, H.  
Glacier oscillation, Glacier mass balance, Glacier flow, Glacier tongues, Mountain glaciers, Seasonal variations, Climatic factors, Distribution.
- 33-3018**  
Observations of the meltwater permeation in the near-surface ice layers of the Mendenhall Glacier, southeast Alaska. (Nabludenie na prosachivaniem taloi vody v pripoверхnostnykh lednykh sloiakh lednika Mendenkhola (Uzhnaya Alaiia)). Wakahama, G., *Akademiia nauk SSSR. Institut geografii. Materialy glatsiologicheskikh issledovaniĭ. Khronika obsuzhdeniia*, 1978, No.33, p.112-116, 175-178, In Russian and English. 6 refs. Discussion p.124, 185.  
Glacier melting, Glacial hydrology, Meltwater, Subglacial drainage, Subsurface drainage, Glacier ablation, Time factor, Capillary ice.
- 33-3019**  
Effect of nocturnal precipitation on the mass balance of the Richa Samba Glacier, Hidden Valley, Nepal. (Vlianie nochnykh osadkov na balans massy lednika Rikkha Samba, dolina Khiden, Nepal). Higuchi, K., *Akademiia nauk SSSR. Institut geografii. Materialy glatsiologicheskikh issledovaniĭ. Khronika obsuzhdeniia*, 1978, No.33, p.117-121, 178-181, In Russian and English. 6 refs. Discussion p.125, 185.  
Glacier mass balance, Glacier ablation, Precipitation (meteorology), Glacier oscillation, Temperature effects.
- 33-3020**  
Glaciological investigations along the Mirny-Pionerskaya-Dome C profile. (Glatsiologicheskie issledovaniia v marshrute Mirnyi-Pionerskaia-Kupol C). Korolev, P.A., et al, *Akademiia nauk SSSR. Institut geografii. Materialy glatsiologicheskikh issledovaniĭ. Khronika obsuzhdeniia*, 1978, No.33, p.191, In Russian.  
Rudolf, A.N.  
Snow accumulation, Snow density, Snow temperature, Ice temperature, Firn, Ice cover thickness, Antarctica—Pionerskaya Station.  
Glacial and geomagnetic studies were carried out in Jan.-March 1978 during the Mirny-Pionerskaya-Dome C traverse. General data on the accumulation and density of snow, obtained from 335 stakes along the traverse, are indicated. The settling of the snow-firn layer, isotope content and snow and ice temperature were examined in three boreholes. N. Young, a scientist from the University of Melbourne, participated in gravimetric, magnetometric and barometric observations.
- 33-3021**  
Possible surges of glaciers in the Eurasian Arctic zone. (Vozmozhnye podvizhki lednikov evraziatskoi arkticheskoi zony). Bozhinskiĭ, A.N., *Akademiia nauk SSSR. Institut geografii. Materialy glatsiologicheskikh issledovaniĭ. Khronika obsuzhdeniia*, 1978, No.33, p.192-196, In Russian with English summary. 9 refs.  
Glacier surges, Glacier oscillation, Slope orientation, Climatic changes, Arctic regions.
- 33-3022**  
Rate of ice melting in water. (O skorosti taniia l'da v vode). Khodakov, V.G., et al, *Akademiia nauk SSSR. Institut geografii. Materialy glatsiologicheskikh issledovaniĭ. Khronika obsuzhdeniia*, 1978, No.33, p.196-200, In Russian with English summary. 11 refs. Includes discussion.  
Godelchik, A.V., Moiseeva, G.P.  
Iceberg towing, Marine transportation, Ice melting, Ice thermal properties, Water supply, Analysis (mathematics).  
Theoretical aspects of ice melting in water are considered. Experimental data, obtained on the Bolshoye Khadatskoye Lake (Polar Urals) and in the laboratory of the Institute of Geography (Moscow), along with available literature permitted to deduce a criterion equation and formula. Melting of an iceberg transported from Antarctica to Australia and Arabia was calculated on the basis of the formula. Calculations show that without special thermal protection the iceberg will be totally consumed by underwater melting.
- 33-3023**  
Dynamically unstable glaciers in the Central Pamira. (Dinamicheski nestabil'nye ledniki Tsentral'nogo Pamira). Rototaev, K.P., *Akademiia nauk SSSR. Institut geografii. Materialy glatsiologicheskikh issledovaniĭ. Khronika obsuzhdeniia*, 1978, No.33, p.201-207, In Russian with English summary.  
Glacier oscillation, Glacier movement, Glacier surges, Glacier surfaces, USSR—Pamira.
- 33-3024**  
Water-ice balance of Spitsbergen glaciers in the 1975/1976 balance year. (Vodnoledovyi balans lednikov Shpitsbergena v 1975/76 balansovom godu). Gus'kov, A.S., et al, *Akademiia nauk SSSR. Institut geografii. Materialy glatsiologicheskikh issledovaniĭ. Khronika obsuzhdeniia*, 1978, No.33, p.207-211, In Russian with English summary. 2 refs.  
Godelchik, A.V.  
Glacial hydrology, Glacier mass balance, Snow accumulation, Snow surveys.
- 33-3025**  
Studies in the mountain-glacier basin of the Bolshaya Khadata River, Polar Urals, in the 1976/77 balance year. (Issledovaniia v gorno-lednikovom basseine r. Bol. Khadata na Poliarom Urale v 1976/77 balansovom godu). Gokhman, V.V., *Akademiia nauk SSSR. Institut geografii. Materialy glatsiologicheskikh issledovaniĭ. Khronika obsuzhdeniia*, 1978, No.33, p.212-215, In Russian with English summary. 5 refs.  
Glacier mass balance, Snow accumulation, Glacial hydrology, Air temperature, Alpine glaciation.
- 33-3026**  
Cement ice of Siberia and the Far East. (Gol'tsovyĭ led Sibiri i iuga Dal'nego Vostoka). Tarakanov, A.G., *Akademiia nauk SSSR. Institut geografii. Materialy glatsiologicheskikh issledovaniĭ. Khronika obsuzhdeniia*, 1978, No.33, p.215-219, In Russian with English summary. 14 refs.  
Ground ice, Ice formation, Meltwater, Freezing, Alpine glaciation.
- 33-3027**  
Application of granulometric and thermal analyses to paleoglaciological reconstructions. (Opyt primeneniia granulometricheskogo i termicheskogo analizov pri paleoglatsiologicheskikh rekonstruktsiakh). Sevast'ianov, D.V., et al, *Akademiia nauk SSSR. Institut geografii. Materialy glatsiologicheskikh issledovaniĭ. Khronika obsuzhdeniia*, 1978, No.33, p.220-224, In Russian with English summary. 7 refs.  
Tarnovskii, A.A.  
Glacial deposits, Moraines, Thermal analysis, Paleoclimatology.
- 33-3028**  
Annual velocity field variations of the isochronous surface of Karabatkak Glacier in 1974-1976. (Kolebaniia polia godovoi skorosti izokhronnoi poverkhnosti lednika Karabatkak v 1974-1976 gg.). Bakov, E.K., *Akademiia nauk SSSR. Institut geografii. Materialy glatsiologicheskikh issledovaniĭ. Khronika obsuzhdeniia*, 1978, No.33, p.225-226, In Russian with English summary. 1 ref.  
Glacier oscillation, Glacier surfaces, Glacier mass balance, Glacier flow, Velocity measurement, Seasonal variations.
- 33-3029**  
Annotated list of Soviet literature on glaciology for 1975. (Annotirovannyĭ spisok sovet'skoi literatury po glatsiologii za 1975 god). Kotliakov, V.M., et al, *Akademiia nauk SSSR. Institut geografii. Materialy glatsiologicheskikh issledovaniĭ. Khronika obsuzhdeniia*, 1978, No.33, p.227-280, In Russian with English summary. 441 refs.  
Lapina, I.I.A., Chernova, L.P.  
Glaciology, Ice physics, Ice composition, Sea ice, River ice, Ground ice, Avalanches, Snow surveys, Mudflows, Bibliographies.  
The list contains Soviet publications on glaciology, published in Russian (or having summaries in Russian) in periodicals, proceedings and transactions of conferences for 1975. Some publications of previous years omitted from earlier bibliographies are included. The annotations are grouped into the following sections: Organization of studies, Scientific meetings, Methods of studies, General problems of glaciology, Physics and chemistry of ice, Sea and river ice, Underground ice and aueis, Paleoglaciology, The Arctic and Antarctic, The Caucasus, Central Asia and Kazakhstan, Siberia and the Far East, Avalanches and mudflows, Studies of snow cover, and Seasonal snow cover outside the areas of present-day glaciers.
- 33-3030**  
Fate and effects of oil pollutants in extremely cold marine environments. Annual report no. 5, 1 Jan-31 Dec 77. Atlas, R.M., University of Louisville, 1977, 53p. ADA-048 334.  
Crude oil, Oil spills, Pollution, Environmental impact, Bacteria, Degradation.
- 33-3031**  
Oil persistence in tundra and its impact on the below-ground ecosystem. Progress report, June 1, 1975-March 1, 1976. Miller, O.K., Jr., Blackstone, Virginia Polytechnic Institute and State University, 1976, 146p. ORO/4940-1.  
Oil spills, Tundra vegetation, Damage, Environmental impact.
- 33-3032**  
Arctic under-ice roughness. LeSchack, L.A., et al, Dec. 1977, 19p. ADA-048 690.  
Chang, D.C.  
Sea ice, Ice cover thickness, Ice bottom surface, Underwater acoustics.
- 33-3033**  
Oil persistence in tundra and its impact on the below-ground ecosystem. Progress report, June 1, 1976-March 1, 1977. Miller, O.K., Jr., Blackstone, Virginia Polytechnic Institute and State University, 1977, 153p. ORO/4940-2.  
Oil spills, Tundra vegetation, Damage, Environmental impact.
- 33-3034**  
Frost degree day and related theoretical ice thickness curves for selected Russian Arctic Stations. Potocsky, G.T., et al, *U.S. Naval Oceanographic Office. Technical note*, Oct. 1972, NOO-TN-7700-8-72, 39p. ADA-048 735.  
Mitchell, P.A.  
Sea ice, Ice growth, Ice cover thickness, Degree days.
- 33-3035**  
Report of the International Ice Patrol Service in the North Atlantic Ocean, season of 1976. Ketchen, H.G., et al, *U.S. Coast Guard. Bulletin*, Apr. 15, 1978, No.62, 82p.  
Jennings, C.W.  
Sea ice, Ice conditions, Icebergs, Aerial reconnaissance, Oceanography.
- 33-3036**  
Air deployed oceanographic mooring (ADOM). Final report, Mar. 1, 1978-Feb. 28, 1979. New Hampshire. University. Marine Systems Engineering Laboratory, Durham, New Hampshire, 1979, c100 leaves, Numerous refs.  
Sea ice, Ice coring drills, Impact tests, Penetration tests, Airborne equipment.

In this report, the technology involved in the design and serial delivery of an unmanned ice drilling system for Arctic pack ice is presented and discussed.

33-3037

Effects of ice covers on alluvial channel flow and sediment transport processes.  
Sayre, W.W., et al, Iowa University, Institute of Hydraulic Research. Report, Feb. 1979, No.218, 96p., 26 refs.  
Song, G.B.  
River ice, Ice cover effect, River flow, Velocity measurement, Sediment transport, Shear stress.

33-3038

Joint studies on physical and biological environments in permafrost, Alaska and North Canada, July to August 1977.  
Kinoshita, S., ed, Hokkaido University, Institute of Low Temperature Science, Dec. 1978, 149p., In English with Japanese summaries. Refs. passim. For individual reports see 33-3039 through 33-3047.  
Active layer, Permafrost hydrology, Tundra soils, Environments, Pingos, Patterned ground, Tundra vegetation, Arctic regions, United States—Alaska—Barrow, Canada—Northwest Territories—Tuktoyaktuk.

33-3039

Outline of research project.  
Kinoshita, S., Joint studies on physical and biological environments in the permafrost, Alaska and North Canada, July to August 1977. Edited by S. Kinoshita, Hokkaido University, Institute of Low Temperature Science, Dec. 1978, p.1-16, In English with Japanese summary. 20 refs.  
Permafrost hydrology, Active layer, Tundra soils, Thermal regime, Landforms, Research projects, Aerial photographs, Arctic regions.

33-3040

Core samplings of the uppermost layer in a tundra area.  
Kinoshita, S., et al, Joint studies on physical and biological environments in the permafrost, Alaska and North Canada, July to August 1977. Edited by S. Kinoshita, Hokkaido University, Institute of Low Temperature Science, Dec. 1978, p.17-44, In English with Japanese summary. 15 refs.  
Fujino, K., Horiguchi, K., Fukuda, M., Inoue, M.  
Permafrost samplers, Tundra soils, Core samplers, Drill core analysis, Patterned ground, Ground ice, Pingos.

33-3041

Thermal regime of the uppermost layer in a tundra area in summertime.  
Inoue, M., et al, Joint studies on physical and biological environments in the permafrost, Alaska and North Canada, July to August 1977. Edited by S. Kinoshita, Hokkaido University, Institute of Low Temperature Science, Dec. 1978, p.45-56, In English with Japanese summary. 9 refs.  
Kinoshita, S.  
Active layer thickness, Thermal regime, Tundra, Permafrost thermal properties, Thermal conductivity, Soil temperature, Freeze thaw cycles.

33-3042

Acidity of the uppermost layer of permafrost—its relationship to the thickness of the active layer.  
Horiguchi, K., Joint studies on physical and biological environments in the permafrost, Alaska and North Canada, July to August 1977. Edited by S. Kinoshita, Hokkaido University, Institute of Low Temperature Science, Dec. 1978, p.57-69, In English with Japanese summary. 10 refs.  
Active layer thickness, Soil chemistry, Acidity, Permafrost.

33-3043

Water-permeability inside the uppermost layer of a tundra area.  
Fujino, K., Joint studies on physical and biological environments in the permafrost, Alaska and North Canada, July to August 1977. Edited by S. Kinoshita, Hokkaido University, Institute of Low Temperature Science, Dec. 1978, p.71-76, In English with Japanese summary. 6 refs.  
Active layer thickness, Ground water, Permeability, Tundra soils, Patterned ground, Permafrost.

33-3044

Determination of oxygen isotopic concentration in the ground ice of a tundra area.  
Fujino, K., et al, Joint studies on physical and biological environments in the permafrost, Alaska and North Canada, July to August 1977. Edited by S. Kinoshita, Hokkaido University, Institute of Low Temperature Science, Dec. 1978, p.77-83, In English with Japanese summary. 9 refs.  
Kato, K.  
Ice composition, Deuterium oxide ice, Ground ice, Oxygen isotopes, Tundra, Permafrost.

33-3045

Diversity in Collembola and topographic features of tundra.  
Tanno, K., et al, Joint studies on physical and biological environments in the permafrost, Alaska and North Canada, July to August 1977. Edited by S. Kinoshita, Hokkaido University, Institute of Low Temperature Science, Dec. 1978, p.85-92, In English with Japanese summary. 5 refs.  
Shimada, K.  
Tundra vegetation, Topographic features, Pingos, Patterned ground, Animals.

33-3046

Zooplankton surveys in arctic temporary ponds at Barrow and Tuktoyaktuk.  
Shimada, K., Joint studies on physical and biological environments in the permafrost, Alaska and North Canada, July to August 1977. Edited by S. Kinoshita, Hokkaido University, Institute of Low Temperature Science, Dec. 1978, p.93-103, In English with Japanese summary. 14 refs.  
Ponds, Continuous permafrost, Plankton, Distribution, Environments, United States—Alaska—Barrow, Canada—Northwest Territories—Tuktoyaktuk.

33-3047

Plant communities in permafrost.  
Ito, K., Joint studies on physical and biological environments in the permafrost, Alaska and North Canada, July to August 1977. Edited by S. Kinoshita, Hokkaido University, Institute of Low Temperature Science, Dec. 1978, p.105-147, In English with Japanese summary. 8 refs.  
Tundra vegetation, Arctic vegetation, Plants (botany), Permafrost, Classifications.

33-3048

Airport pavement design and evaluation. U.S. Federal Aviation Administration. Advisory circular, Dec. 7, 1978, AC 153/5320-6C, 15p. + 4 append., 24 refs.  
Airports, Aircraft landing areas, Concrete pavements, Soil strength, Subgrades, Permafrost beneath roads, Design, Soil classification, Pavements.

33-3049

Some problems of photogrammetry in Antarctica.  
Dressler, K., *Jena review*, 1975, No.2, p.88-92, back cover, 10 refs.  
Photogrammetry, Stereophotography, Topographic features, Geodetic surveys, Glacier surfaces, Meteorological data, Measuring instruments.  
An aerophotogrammetric method used during the 17th Soviet Antarctic Expedition to determine topographic features of a traverse of 100 km length with side lengths of 3 to 5 km is described. Difficulties encountered because of frequent snowstorms, low air temperature, poor visibility and excessive albedo are discussed. About 140 stereomodels and 36 single photographs were taken from 25 bases in 76 directions, using a 191318 Phototheodolite. To reduce errors in aerophotogrammetry the following suggestion is made: the tracks of sledges are distinctly recognizable in the aerial photograph. If the caterpillar tractor moves around the geodetic fixed points in a circle, the tracks can serve as ground control points of maximum accuracy visible from the air. The photographic flight should be carried out as soon as possible after having finished this marking work.

33-3050

Ground water quality summary for Alaska. A terminal report.  
Kim, S.W., et al, Alaska University, Institute of Water Resources. Report, 1969, IWR-10, 32p., PB-187 683, Refs. p.31-32.  
Johnson, P.R., Murphy, R.S.  
Ground water, Water supply, Economic analysis, United States—Alaska.

33-3051

Application of artificial recharge technology for managing the water resources—Anchorage, Alaska.  
Guymon, G.L., Alaska University, Institute of Water Resources. Report, June 1972, IWR-24, 39p., PB-211 331, Refs. p.37-39.  
Water supply, Ground water, Water table, Fluid infiltration, Water reserves, United States—Alaska—Anchorage.

33-3052

Analysis of the demands for water from the private sector in a sub-Arctic urban area.  
Haring, R.C., Alaska University, Institute of Water Resources. Report, Apr. 1972, IWR-22, 64p. PB-211 610.  
Water supply, Ground water, Urban planning, Cold weather operation, Subarctic regions, Cost analysis, Floods.

33-3053

Light attenuation in falling snow.  
Mason, J.B., U.S. Army, Electronics Research and Development Command, Atmospheric Sciences Laboratory. Research and development technical report, Aug. 1978, ASL-TR-0013, 15p., ADA-061 604, 17 refs.  
Snow optics, Snowfall, Light scattering, Optical phenomena, Visibility, Atmospheric attenuation.

33-3054

Improving the operability of diesel vehicles at low temperature.  
Vanic, M., et al, U.S. Army Foreign Science and Technology Center. Technical translation, Dec. 1978, HT-655-78, 13p., Translation from Goriva i maziva, 1976, 15(5), p.3-10. 3 refs.  
Simik, V.  
Cold weather operation, Vehicles, Diesel engines, Engine starters, Temperature variations.

33-3055

Deicing salts, their use and effects.  
Chance, R.L., National Association of Corrosion Engineers. Publication, Apr. 1974, No.3N175, p.9-15, 67 refs.  
Snow removal, Ice removal, Salting, Economic analysis, Corrosion.

33-3056

Preliminary report on the coal resources of the National Petroleum Reserve in Alaska.  
Martin, G.C., et al, U.S. Geological Survey. Open-file report, 1978, No.78-1033, 23p. + 2 maps, 33 refs.  
Callahan, J.E.  
Natural resources, Frozen coal, Geologic structures, Permafrost.

33-3057

Proceedings.  
Colloquium on Planetary Water and Polar Processes, 2nd, Oct. 1978, MP 1193, Hanover, N.H., U.S. Army Cold Regions Research and Engineering Laboratory, 1978, 209p., For selected papers see 33-3058 through 33-3080. Abstracts of many of the papers in this volume have been previously accessioned from the preliminary publication of this colloquium, Collection of Abstracts, and may be found as 33-1984 through 33-2001. Texts of question and answer sessions which followed presentations have been added to most of the abstracts duplicated in the Proceedings, volume. Meetings, Mars (planet), Planetary environments, Permafrost hydrology, Geologic structures, Water.

33-3058

Studies on terrestrial ice cores.  
Langway, C.C., Jr., Colloquium on Planetary Water and Polar Processes, 2nd, Oct. 1978. Proceedings, Hanover, N.H., U.S. Army Cold Regions Research and Engineering Laboratory, 1978, p.11-27., Refs. p.24-27.  
Ice sheets, Ice cores, Isotope analysis, Age determination.

The author reviews the progress achieved since about 1965 in retrieving and analyzing polar ice cores. Most of the studies concern Greenland cores but many of the citations include work done in Antarctica. Significant advances are recorded in the technology of retrieval as well as in the scope and detail of the analyses which include: chemistry, stratigraphy, physical properties, microparticles, and stable and radioactive isotopes. Results of the investigations over the years have had significant bearing on a substantial number of scientific disciplines.

33-3059

Development of a simplified method for field monitoring of soil moisture.  
Walsh, J.E., et al, MP 1194, Colloquium on Planetary Water and Polar Processes, 2nd, Oct. 1978. Proceedings, Hanover, N.H., U.S. Army Cold Regions Research and Engineering Laboratory, 1978, p.40-44, Includes comments. 3 refs.  
McQueeney, D., Layman, R.W., McKim, H.L.  
Soil moisture, Measuring instruments, Electric equipment.

33-3060

Viking GCMS analysis of water in the Martian regolith.

Anderson, D.M., et al, MP 1195, Colloquium on Planetary Water and Polar Processes, 2nd, Oct. 1978. Proceedings, Hanover, N.H., U.S. Army Cold Regions Research and Engineering Laboratory, 1978, p.55-61, Includes comments. 7 refs.

Tice, A.R.

Ground water, Mars (planet), Soil tests, Gas inclusions.

33-3061

Mars: chemical reduction of the regolith by frost.

Huguenin, R.L., et al, Colloquium on Planetary Water and Polar Processes, 2nd, Oct. 1978. Proceedings, Hanover, N.H., U.S. Army Cold Regions Research and Engineering Laboratory, 1978, p.83-99, Includes comments. 27 refs.

Miller, K.J., Harwood, W.S.

Soil chemistry, Chemical reactions, Frost action, Weathering.

33-3062

Mars: remote spectral identification of H<sub>2</sub>O frost and mineral hydrate.

Huguenin, R.L., et al, Colloquium on Planetary Water and Polar Processes, 2nd, Oct. 1978. Proceedings, Hanover, N.H., U.S. Army Cold Regions Research and Engineering Laboratory, 1978, p.100-108, Includes comments. 19 refs.

Clark, R.N., McCord, T.B.

Spectrometers, Reflectance, Hydrates, Frost, Soil moisture.

33-3063

Mars permafrost sampling requirements.

Stephens, J., Colloquium on Planetary Water and Polar Processes, 2nd, Oct. 1978. Proceedings, Hanover, N.H., U.S. Army Cold Regions Research and Engineering Laboratory, 1978, p.111-114, Includes comments.

Mars (planet), Permafrost samplers.

33-3064

Episodic channeling and layered terrain on Mars: implications for ground ice.

Thelie, E., et al, Colloquium on Planetary Water and Polar Processes, 2nd, Oct. 1978. Proceedings, Hanover, N.H., U.S. Army Cold Regions Research and Engineering Laboratory, 1978, p.151-157, Includes comments. 9 refs.

Greeley, R.

Mars (planet), Soil structure, Ground ice, Topographic features.

33-3065

Martian polar layered deposits: the geological consequences of dust storms.

Blasius, K.R., et al, Colloquium on Planetary Water and Polar Processes, 2nd, Oct. 1978. Proceedings, Hanover, N.H., U.S. Army Cold Regions Research and Engineering Laboratory, 1978, p.173-178, Includes comments. 1 ref.

Cutts, J.A., Roberts, W.J.

Mars (planet), Extraterrestrial ice, Cosmic dust, Topographic features.

33-3066

Solar activity records planetary ice caps.

Zeller, E.J., et al, Colloquium on Planetary Water and Polar Processes, 2nd, Oct. 1978. Proceedings, Hanover, N.H., U.S. Army Cold Regions Research and Engineering Laboratory, 1978, p.186-192, Includes comments. 2 refs.

Parker, B.C.

Ice sheets, Ice cores, Ion density (concentration), Antarctica—Amundsen-Scott Station.

The authors describe the results of chemical analyses made on an ice core from South Pole Station. Nitrate and ammonium ion levels are identified and traced from the 10th century to the early part of the 20th. The fluctuations in ionic level are related to solar activity and climatology during this 1000 yr period. Extending this type of sequential analysis to other planets or satellites having ice caps must take into account the composition and structure of their atmospheres.

33-3067

Local snow distribution on Axel Heiberg Island, N.W.T. Empirical methods for extrapolating snow course data on White Glacier.

[Lokale Schneeverteilung auf Axel Heiberg Island, N.W.T. Empirische Methode zur Extrapolation von Schneekursdaten auf dem White Glacier].

Steffen, K., et al, *Geographica helvetica*, 1977, 32(4), p.195-202, In German. 10 refs.

Müller, F.

Snow cover distribution, Snow courses, Tundra regions.

33-3068

On the mass budget of Baby Glacier, Axel Heiberg Island, Canadian High Arctic. (Zum Massenhaushalt des Baby Glacier, Axel Heiberg Island, kanadische Hocharktis).

Alean, J., et al, *Geographica helvetica*, 1977, 32(4), p.203-208, In German. 9 refs.

Müller, F.

Glacier mass balance, Seasonal variations.

33-3069

Mass budget of Laika Glacier, Coburg Island, Canadian Arctic Archipelago. (Massenhaushalt des Laika Glacier, Coburg Island, kanadischer arktischer Archipel).

Berger, P., et al, *Geographica helvetica*, 1977, 32(4), p.209-212, In German. 3 refs.

Müller, F.

Glacier mass balance, Glacier ablation.

33-3070

On climate and plants on Coburg Island, N.W.T., Canada. (Über Pflanzen und Klima auf Coburg Island, N.W.T., Kanada).

Müller, F., *Geographica helvetica*, 1977, 32(4), p.213-218, In German. 6 refs.

Climatology, Plants (botany), Water supply, Wind factors, Ecosystems.

33-3071

Land application of sludge. *Soil conservation*, Apr. 1979, 44(9), p.4-5.

Waste disposal, Sludges, Irrigation.

33-3072

Low temperature adapted submersible spectrophotometers for use in floating ice research.

Adams, W.A., et al, *Canada. Inland Waters Directorate. Scientific series*, 1978, No.82, 15p., In English with French summary. 9 refs.

Flavelle, P.A.

Measuring instruments, Spectrophotometers, Solar radiation, Floating ice, Research projects.

33-3073

Geotechnic evaluation of the proposed ALCAN gas pipeline in Alaska.

Iroquois Research Institute, Falls Church, Virginia, 1976, 292p., 143 refs.

DLC TN880.5176 1976

Gas pipelines, Cold weather construction, Environmental impact, Frost heave, River crossings, Frozen ground mechanics, Frozen ground thermodynamics.

33-3074

Proceedings.

Arctic Environmental Workshop, 7th, April 1978, Toronto. University. Institute for Environmental Studies. Publication, 1978, EE8, 161p., For selected papers see 33-3075 through 33-3080.

Jones, S., ed, Mackay, D., ed.

Meetings, Offshore drilling, Artificial islands, Oil spills, Environments.

33-3075

Arctic islands underwater completions.

Franklin, L.J., Toronto. University. Institute for Environmental Studies. Publication, 1978, EE8, Arctic Environmental Workshop, 7th, April 1978.

Proceedings, edited by S. Jones and D. Mackay, p.19-24 + 2 figs.

Pipe laying, Offshore drilling, Ice scoring, Oil wells, Protective coatings, Ice cover, Artificial islands.

33-3076

Technology update—artificial islands in the Beaufort Sea.

Garratt, D., Toronto. University. Institute for Environmental Studies. Publication, 1978, EE8, Arctic Environmental Workshop, 7th, April 1978.

Proceedings, edited by S. Jones and D. Mackay, p.25-38 + 2 figs.

Offshore drilling, Artificial islands, Sea ice, Ocean waves, Ice pressure, Wind factors.

33-3077

Drilling vessel types.

Plé, C., Toronto. University. Institute for Environmental Studies. Publication, 1978, EE8, Arctic Environmental Workshop, 7th, April 1978.

Proceedings, edited by S. Jones and D. Mackay, p.39-46 + 2 figs.

Offshore drilling, Ships, Icebergs.

33-3078

Beaufort Sea drilling.

Todd, M.B., Toronto. University. Institute for Environmental Studies. Publication, 1978, EE8, Arctic Environmental Workshop, 7th, April 1978.

Proceedings, edited by S. Jones and D. Mackay, p.47-66.

Offshore drilling, Sea ice, Ships, Logistics.

33-3079

Biologist looks at oil in the sea.

Manin, K.H., Toronto. University. Institute for Environmental Studies. Publication, 1978, EE8, Arctic Environmental Workshop, 7th, April 1978. Proceedings, edited by S. Jones and D. Mackay, p.67-73.

Oil spills, Marine biology.

33-3080

Oilspill workshop.

Telford, A.S., Toronto. University. Institute for Environmental Studies. Publication, 1978, EE8, Arctic Environmental Workshop, 7th, April 1978.

Proceedings, edited by S. Jones and D. Mackay, p.103-117, Includes comments by various panel members.

Oil spills, Environmental impact, Marine biology, Sea ice, Countermeasures.

33-3081

Snow loads on roofs—an interim report on a survey (CP 33/76).

Mitchell, G.R., Building Research Establishment. Building research series, 1978, Vol.7, Wind and snow loading, p.177-190, 1 ref.

Snow loads, Roofs, Snow surveys, Snow depth, Wind factors, Snow water equivalent.

33-3082

Proceedings, Pts. 1,2. (15. Internationale Tagung für Alpine Meteorologie, Grindelwald, 19-23 Sept. 1978. Tagungsbericht, Teil 1,2).

International Meeting on Alpine Meteorology, 15th, Grindelwald, Switzerland, Sep. 19-23, 1978.

Schweizerische Meteorologische Zentralanstalt. Veröffentlichungen, No. 40,41, Schweizerische Meteorologische Zentralanstalt, 1978, 395p., In German, Italian, English and French. Refs. passim. For pertinent papers see 33-3083 through 33-3091.

Snowfall, Snow accumulation, Snow cover distribution, Ice accretion, Freezepup, Firn, Meteorological factors, Mountains.

33-3083

Quantitative assessment of the short wave radiation balance of a glacier. (Quantitative Erfassung der kurzwelligen Strahlungsbilanz eines Gletschers).

Escher-Vetter, H., Schweizerische Meteorologische Zentralanstalt. Veröffentlichungen, 1978, No.40, International Meeting on Alpine Meteorology, 15th, Grindelwald, Switzerland, Sep. 19-23, 1978.

Proceedings, p.247-250, In German with English summary. 3 refs.

Radiation balance, Glacial meteorology, Albedo, Solar radiation, Wave propagation, Aerial photographs.

33-3084

Study of the water table on the Kesselwandferner, Oetzal Alps, in a firn pit 30 m deep. Summary. (Untersuchungen der Wassertafel am Kesselwandferner (Ötzalferner) an einem 30 m tiefen Firnschacht. Kurzfassung).

Ambach, W., et al, Schweizerische Meteorologische Zentralanstalt. Veröffentlichungen, 1978, No.40, International Meeting on Alpine Meteorology, 15th, Grindelwald, Switzerland, Sep. 19-23, 1978.

Proceedings, p.251-253, In German with English summary. 7 refs.

Water table, Firn, Glacier surfaces, Drilling.

33-3085

Probability and intensity of major snowfalls in mountains, particularly in the Davos region. (Wahrscheinlichkeit und Ergiebigkeit von Grossschneefällen im Gebirge, insbesondere in der Region Davos).

Föhn, P.M.B., Schweizerische Meteorologische Zentralanstalt. Veröffentlichungen, 1978, No.40, International Meeting on Alpine Meteorology, 15th, Grindelwald, Switzerland, Sep. 19-23, 1978.

Proceedings, p.288-292, In German with English summary. 7 refs.

Snowfall, Snow accumulation, Statistical data, Snow depth, Design criteria, Switzerland—Davos.

33-3086

Relationships of days with snow cover to days with snowfall in mountain areas of Serbia, Yugoslavia. (Verhältnis der Tage mit Schneedecke zu den Tagen mit Schneefall in den Gebirgsgebieten Serbiens in Jugoslawien).

Milosavljević, K., et al, Schweizerische Meteorologische Zentralanstalt. Veröffentlichungen, 1978, No.40, International Meeting on Alpine Meteorology, 15th, Grindelwald, Switzerland, Sep. 19-23, 1978.

Proceedings, p.293-296, In German with English summary. 2 refs.

Todorović, N.

Snow cover distribution, Snowfall, Snow cover stability, Time factor.

- 33-3087  
Geographic distribution of icing in Liguria. (La distribuzione geografica delle formazioni di ghiaccio in Liguria). Flocchini, G., et al. *Schweizerische Meteorologische Zentralanstalt. Veröffentlichungen*, 1978, No.40, International Meeting on Alpine Meteorology, 15th, Grindelwald, Switzerland, Sep. 19-23, 1978. Proceedings, p.297-300. In Italian with English summary. 10 refs.
- Palau, C., Tessore, E.  
Icing, Alpine vegetation, Damage, Distribution, Topographic factors, Mountains, Italy—Liguria.
- 33-3088  
Snow characteristics of the Po Valley slope of the northern Apennines. (La nevosità sul versante padano dell'Appennino settentrionale). Zanella, G., *Schweizerische Meteorologische Zentralanstalt. Veröffentlichungen*, 1978, No.40, International Meeting on Alpine Meteorology, 15th, Grindelwald, Switzerland, Sep. 19-23, 1978. Proceedings, p.301-304. In Italian with English summary. 9 refs.
- Snow accumulation, Snow cover distribution, Snow depth, Mountains, Altitude, Italy—Po Valley.
- 33-3089  
Situations responsible for late snowfalls in the French Alps. (Situations à l'origine de chutes de neige tardives sur les Alpes Françaises). Duclay, J.E., *Schweizerische Meteorologische Zentralanstalt. Veröffentlichungen*, 1978, No.40, International Meeting on Alpine Meteorology, 15th, Grindelwald, Switzerland, Sep. 19-23, 1978. Proceedings, p.305-307. In French with English summary.
- Snowfall, Snow cover distribution, Time factor, Weather forecasting, France—Alps.
- 33-3090  
Ice depositions in Romanian mountainous regions. Tepes, E., *Schweizerische Meteorologische Zentralanstalt. Veröffentlichungen*, 1978, No.40, International Meeting on Alpine Meteorology, 15th, Grindelwald, Switzerland, Sep. 19-23, 1978. Proceedings, p.308-312, 3 refs.
- Ice accretion, Icing, Structures, Mountains.
- 33-3091  
Numerical simulation of river freezeup in relation to meteorological parameters as exemplified by the Loisach River, Bavaria. (Numerische Simulation von Flussvereisungen in Abhängigkeit meteorologischer Parameter am Beispiel der Loisach/Oberbayern). Witte, N., *Schweizerische Meteorologische Zentralanstalt. Veröffentlichungen*, 1978, No.40, International Meeting on Alpine Meteorology, 15th, Grindelwald, Switzerland, Sep. 19-23, 1978. Proceedings, p.325-328. In German with English summary. 7 refs.
- Freezeup, River ice, Mathematical models, Meteorological factors.
- 33-3092  
Environmental assessment of the Alaskan continental shelf, Vol.2. Boulder, Colorado, Environmental Research Laboratories, 1978, 679p., Principal investigators' reports July-September 1978. For selected reports see 33-3093 through 33-3101.
- Research projects, Sea ice, Oil pollution, Water chemistry, Submarine permafrost, Sediment transport, Earthquakes.
- 33-3093  
Oil spill vulnerability, coastal morphology and sedimentation of Kodiak Island, Kotzebue Sound and the Beaufort Coast. Hayes, M.O., et al. Environmental assessment of the Alaskan continental shelf, Vol.2. Principal investigators' reports July-Sep. 1978, Boulder, Colorado, Environmental Research Laboratories, 1978, p.189-193.
- Nummedal, D., Ruby, C.  
Coastal topographic features, Shoreline modification.
- 33-3094  
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33-3121

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Freeze thaw tests, Frost resistance, Concrete durability, Laboratory techniques.

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Sollie, F., Lysaker, Norway, Fridtjof Nansen-Stiftelsen på Polhøgda, 1978, 12p., In Norwegian.

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Ignatov, V.S., ed.

Research projects, Antarctica.

This volume reports on the winter activities of the 19th SAE. The first half includes a description of the expedition's program, short reports on the activities of each working group's accomplishments, and a summary of engineering and construction work carried out during the period. The second half is composed of articles written by expedition members to report on

their work in geophysics, atmospheric physics, oceanography, zoology, medicine and other disciplines.

33-3126

Winter activities of the 19th SAE. [Zimovochnye raboty deviatnadtsatoi sovetsskoj antarkticheskoi ekspeditsii], Ignatov, V.S., *Sovetskaya antarkticheskaya ekspeditsiya. Trudy*, 1978, Vol.69, p.9-48, In Russian.

Research projects, Antarctica.

This overall description of the wintering over activities of the 19th SAE is divided into two sections. The first outlines the organization and methods of the scientific activities—observational program, surface and upper-air meteorological research, geophysical studies, glaciological investigations, oceanographic research, and medical research. The second portion covers the engineering and construction work accomplished by the group. Appended is a list of expedition participants by station and specialty.

33-3127

Geodetic and meteorological investigations of ground refraction over antarctic continental ice. [Geodezicheskie i meteorologicheskie issledovaniya zemnoi refraktsii nad poverkhnost'iu antarkticheskogo materikovogo l'da],

Dittrich, G., et al, *Sovetskaya antarkticheskaya ekspeditsiya. Trudy*, 1978, Vol.69, p.100-119, In Russian. 10 refs.

Helwig, A.

Glacial meteorology, Refraction.

Preliminary results of investigations into the effect of ground refraction on accuracy of vertical angles and distance measurement in Antarctica are given. Studies were done by a group of meteorologists and geodesists by means of simultaneous geodetic and meteorological observations at three fixed points under various weather conditions. The coefficient of refraction was computed from vertical gradient air temperature data, then compared with the refraction coefficient from geodetic readings. Thus can the effect of ground refraction on accuracy in high southern latitudes be assessed.

33-3128

Influence of freezing and thawing on the resilient properties of a silt soil beneath an asphalt concrete pavement.

Johnson, T.C., et al, *U.S. Army Cold Regions Research and Engineering Laboratory*, Sep. 1978, CR 78-23, 59p., See also 32-3761.

Cole, D.M., Chamberlain, E.J.

Bituminous concretes, Subgrade soils, Soil freezing, Ground thawing, Elastic properties.

Stress-deformation data for silt subgrade soil were obtained from in-situ and laboratory tests, for use in mechanistic models for design of pavements affected by frost action. Plate-bearing tests were run on bituminous concrete pavements constructed directly on a silt subgrade, applying repeated loads to the pavement surface while the silt was frozen, thawing, thawed, and fully recovered. Repeated-load laboratory triaxial tests were performed on the silt in the same conditions. Analysis of deflection data from the in-situ tests showed resilient moduli of the silt as low as 2000 kPa for the critical thawing period, and 100,000 kPa or higher when silt was fully recovered. Analysis of the laboratory tests, which gave moduli comparable to the latter values, showed that resilient modulus during recovery from the thaw-weakened condition can be modeled as a function of the changing moisture content.

33-3129

Wastewater treatment and reuse by the soil-plant systems.

Gilley, J.R., Lincoln, University of Nebraska, 1977, 25p. PB-275 595.

Water treatment, Waste disposal, Irrigation, Soil chemistry.

33-3130

Scientific plan for the proposed Nansen drift station.

Untersteiner, N., et al, Washington, D.C., National Research Council, 1976, 256p. ADA-047 621.

Aggaard, K., Alexander, V., Anderson, J., Barnett, D. Research projects, Drift stations, Icebreakers, Pack ice, Logistics.

33-3131

Significance of frost action and surface soil characteristics to wind erosion at Rocky Flats, Colorado.

Third progress report, October 1, 1976-June 30, 1977.

Caine, N., et al, Boulder, Institute of Arctic and Alpine Research, 1977, 65p. COO-2517-3.

Morin, P., Nicholas, R.M.

Frost action, Soil freezing, Ground thawing, Wind erosion, Soil structure.

33-3132

Naval Oceanographic Office numerical ice forecasting system operations manual.

Owens, L.B., Jr., et al, *U.S. Naval Oceanographic Office. Technical note*, Nov 1974, NOO-TN-6150-33, 74, 27p. ADA-049 019.

Gerson, D.J.

Manuals, Ice forecasting, Mathematical models, Computer application.

33-3133

Rolling resistance of aircraft wheels in dry snow. Kinigren, B., *National Swedish Road and Traffic Research Institute. Report*, 1977, VTI-128, 36p., N78-14041, In Swedish with English summary.

Airplanes, Vehicle wheels, Friction, Snow cover effect.

33-3134

Photosynthetically active radiation transmission through ice. *U.S. National Oceanic and Atmospheric Administration. Technical memorandum*, July 1978, NOAA-TM-ERL-GLERL-18, 57p. PB-288 463.

Lake ice, Ice cover effect, Solar radiation, Photosynthesis.

33-3135

Studies of snowpack properties by passive microwave radiometry.

Chang, A.T.C., et al, *U.S. National Aeronautics and Space Administration. Technical memorandum*, Nov. 1978, NASA-TM-79671, 17p. N79-16479.

Hall, D.K., Foster, J.L., Rango, A., Schmugge, T.J. Snow physics, Snow mechanics, Microwaves, Radiometry, Snow temperature, Snow water content.

33-3136

Snowpack ground truth: radar test site, Steamboat Springs, Colorado, 8-16 April 1976.

Howell, S., et al, *U.S. National Aeronautics and Space Administration. Contractor report*, Apr. 1976, NASA-CR-144773, 30p. N76-28633.

Jones, E.B., Leaf, C.F. Snow density, Snow depth, Soil moisture, Temperature measurement.

33-3137

Performance of frost heave modifying chemical additives at the CN Doryal test site.

Sheeran, D.E., et al, *McGill University, Montreal. Geotechnical Research Centre. Technical report*, Q. 1978, TDC/TP-1814, 94p. PB-289 708.

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Frost heave, Countermeasures, Chemical ice prevention, Railroads, Roadbeds.

33-3138

Glacier and ice sheet sliding: priorities for research. National Research Council. Ad Hoc Study Group on Glacier and Ice Sheet Sliding, Washington, D.C., National Research Council, 1976, 10p., PB-288 573, 21 refs.

Research projects, Ice sheets, Glacier movement.

33-3139

Carbon and nitrogen transformations in soils amended with sewage sludge.

Terry, R.E., Lafayette, Indiana, Purdue University, 1976, 183p., PB-288 945, Ph.D. thesis.

Soil chemistry, Waste treatment, Sludges, Sewage treatment.

33-3140

U.S. contribution to the Polar Experiment (POLEX). Part 1. POLEX-GARP (North). Part 2. POLEX-GARP (South).

Joint U.S. Polex Panel, Washington, D.C., 1974, 173p.

Research projects, Sea ice, Ice cover effect, Weather forecasting, Heat balance.

This publication reviews the national research effort in both polar regions to determine the physical basis for climates; defines the national contribution to polar research; explores the means for international collaboration; and continues review of the scientific merits of the Arctic Ice Dynamics Joint Experiment (AIDJEX). Both parts outline general and specific recommendations, background information and considerations affecting the U.S. contribution, a summary of program elements, and a time schedule for execution of the program. In addition, Part 1 contains appendices A through F which are devoted to the following respective topics: meteorological observations in support of weather forecasting, processes at and above the ice, heat balance of the polar oceans, numerical modeling experiments, climate record, and abbreviations. (Auth.)

33-3141

Transport of shore stones by ice in the Airsto area, southwest Finland, winter 1975/76. [Jään aiheuttama rantakivien kulkeutuminen talvella 1975/76 airston alueella].

Pykkari, M., Turku, Finland. Yliopisto. Maantieteelliset laitos. *Julkaisu*, 1978, No.84, 18p., In Finnish with English summary. 27 refs.

Ice rafting, Beaches, Rocks, Finland.

33-3142

Arctic oil spill countermeasures logistics study: summary report.

De Leuw Cather, Canada Ltd., et al, Canada. *Environmental Protection Service. Report*, Dec. 1978, EPS 3-EC-78-8, 59p., In English with French summary.

Oil spills, Countermeasures, Logistics, Marine transportation, Airplanes, Motor vehicles, Railroads.

- 33-3143  
Review of ice movement buoys for tracking oil spills. Goodman, R.H., Canada. *Environmental Protection Service. Report*, Dec. 1978, EPS 3-EC-78-7, 38p., In English with French summary. 15 refs.  
Pack ice, Drift, Ice navigation, Remote sensing, Oil spills.
- 33-3144  
Surface and bedrock contour maps at DYE-3. Overgaard, S., et al, Copenhagen. *Polyteknisk Jærenstalt. Laboratoriet for elektromagnetisk feltteori. Report*, July 1978, No.199, 9 leaves, 6 refs. Gudmandsen, P.  
Mapping, Radio echo soundings, Ice cover thickness, Land ice, Greenland.
- 33-3145  
Theory, development and testing of an ice-oil boom. Tsang, G., Canada. *Environmental Protection Service. Report*, Mar. 1979, EPS 4-EC-79-2, 61p., In English with French summary. 8 refs.  
Oil spills, Floating ice, Ice booms.
- 33-3146  
CEL building and experimental subgrade cooling system, Barrow, Alaska—construction history and performance characteristics. Barthelmy, J.L., U.S. Naval Construction Battalion Center, Port Hueneme, Calif. *Civil Engineering Laboratory. Technical report*, Mar. 1979, R870, 56p., 14 refs.  
Permafrost preservation, Cooling, Buildings, Subgrades, Heat transfer.  
During the summer of 1976, personnel from the Civil Engineering Laboratory erected a building on the ice-rich permafrost near Barrow, Alaska. The structure, placed on just 1 foot of gravel, has been used as a test bed to evaluate an experimental subgrade cooling system. The cooling system consists of 15 loop-configured heat exchangers called convection cells. During the winter months, heat losses from the building into the permafrost are redirected via these convection cells to the cold environment outside, thus preventing progressive degradation from thaw. To date, data collected from some 150 thermocouples located in the subgrade and heat-exchange systems have shown that the rate of winter heat removal is even greater than originally anticipated. Although a small cyclical displacement of the floor and foundation resulting from seasonal summer thaw and winter freezeback has been apparent, this movement is minimal compared to settlement which would have occurred had the massive ice present in the subgrade been allowed to thaw unchecked.
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Environmental assessment of the Alaskan continental shelf. Executive summary, Apr. 1977-Mar. 1978. Boulder, Colorado, Environmental Research Laboratories, 1978, 64p.  
Research projects, Data processing, Logistics.
- 33-3148  
Study of ice adhesion to construction materials, anti-corrosion and anticling coatings. (Isledovanie adhezii i antiklebovnykh materialam, antikorrozionnyy i antiklebovnyy nym pokrytiyam). Tkachev, A.G., et al, *Kholodil'naya tekhnika*, 1976, No.8, p.15-18, In Russian. 8 refs.  
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Ice adhesion, Protective coatings, Adhesive strength, Surface roughness, Construction materials, Thermal factors, Corrosion prevention, Ice prevention.
- 33-3149  
Flood characteristics of Alaskan streams. Lamke, R.D., U.S. Geological Survey. *Water resources investigations*, 1979, No.78-129, 61p., 5 refs.  
Floods, Streams, Drainage, Climatic factors, Precipitation gages, Analysis (mathematics), Arctic regions, United States—Alaska.
- 33-3150  
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Glacial geology, Geomorphology, Glacial till, Sediments, Moraines, Glacier ablation, Subglacial observations, Landforms, Topographic features.
- 33-3152  
Hall effect in ice. Rose, D.N., College Station, Texas A. and M. University, 1971, 61p., University Microfilms order No.71-24,706, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, Sep. 1971, p.1794.  
Ice crystals, Ice physics, Proton transport, Accuracy.
- 33-3153  
Wind tunnel study on the growth of graupel. Pfaff, J.C., Los Angeles, University of California, 1978, 126p., University Microfilms order No.7823395, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, Dec. 1978, p.2857.  
Snow pellets, Snow crystal growth, Wind tunnels, Hydrodynamics, Ice accretion, Hoarfrost, Cloud chambers.
- 33-3154  
Copepod distributional ecology in a glacial run-off fjord. Stone, D.P., Vancouver, University of British Columbia, Canada, 1978, n.p., Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, March 1979, p.4248. Microfilm from the National Library of Canada.  
Glacial hydrology, Runoff, Plankton, Marine biology, Water temperature, Salinity, Hydrography, Canada—British Columbia—Knight Inlet.
- 33-3155  
Ecological aspects of energy capture and utilization in four Arctic and alpine rosette species of *Saxifraga*. Masters, M.A., Durham, N.C., Duke University, 1978, 355p., University Microfilms order No.7905364, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, March 1979, p.4175.  
Alpine vegetation, Tundra vegetation, Plant ecology, Plant physiology, Arctic vegetation, Environments, Air temperature, Solar radiation.
- 33-3156  
Ice ablation measured by stakes and by terrestrial photogrammetry—a comparison on the lower part of the White Glacier, Axel Heiberg Island, Canada. Arnold, K.C., Montreal, P.Q., McGill University, 1978, n.p., Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, March 1979, p.4244. Microfilm from the National Library of Canada.  
Glacier ablation, Markers, Photogrammetry, Aerial photographs, Measuring instruments.
- 33-3157  
Correlation between the pore-size distributions and freeze-thaw durability of coarse aggregates in concrete. Kanculji, M., Lafayette, Ind., Purdue University, 1978, 157p., University Microfilms order No.7905731, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, Mar.1979, p.4492.  
Concrete durability, Concrete freezing, Freeze thaw tests, Concrete aggregates.
- 33-3158  
Influence of climate on glaciers and permafrost. Thompson, R.D., Geographical papers, No.57, Reading, England, University, 1977, 44p., 26 refs.  
Glacier mass balance, Permafrost distribution, Climatic factors, Snow accumulation, Ice thermal properties, Tundra, Ground thawing, Heat flux, Active layer thickness, Topographic effects, Human factors.
- 33-3159  
Geobotanical and ecological observations at two locations in the west-central Siberian Arctic. Webber, P.J., et al, *Arctic and alpine research*, 1977, 9(3), p.305-315, 10 refs.  
Klein, D.R.  
Tundra vegetation, Ecology, Ecosystems, Landforms, Arctic regions, Animals, USSR—Siberia.
- 33-3160  
Dielectric properties of ice microcrystal dispersions: some comments on a discussion. (Propriétés diélectriques des dispersions de microcristaux de glace: commentaires sur une "mise au point"). Lagourette, B., et al, *Journal de physique*, June 1978, 39(6), p.718-721, In French. 75 refs. Comments on 32-1683.  
Boned, C., Babin, L.  
Ice dielectrics, Dispersions, Microstructure, Ice temperature, Ice relaxation, Temperature effects.
- 33-3161  
Selected papers from: Third International Conference on Port and Ocean Engineering Under Arctic Conditions. McCormick, M.E., ed, *Ocean engineering*, Oct. 1976, 3(5), p.263-373. For other versions of these selected papers see: 31-1934, 31-1937, 32-2205, 32-2215, 32-2216, 32-2233, 32-2239, 32-2240, 32-2252. Cited items in Vol. 32 are the conference versions of the papers edited to greater or lesser extent for inclusion in this collection. The two items from Vol. 31 were based on a symposium held in conjunction with the conference but do not appear in the conference proceedings. They were published separately in Occasional Publication No. 4 of the Institute of Marine Science at the University of Alaska.  
Meetings, Sea ice, Ice pressure, Offshore structures, Wind (meteorology), Ocean currents.
- 33-3162  
Remote sensing as an aid for navigation in ice-covered areas. Thoren, R., Freiburg, West German, 1978, 54p., N79-16836, Presented at the Symposium on Remote Sensing, International Society for Photogrammetry, Freiburg, July 2-8, 1978.  
Remote sensing, Ice navigation, Photointerpretation, Sea ice.
- 33-3163  
Temperature measurements on the Vickers Viscount stabilizer in flight under icing conditions. Bertelrud, A., Stockholm, Aeronautical Res. Inst. of Sweden, Aug. 1977, 35p. N79-16845.  
Temperature measurement, Aircraft icing, Heat loss.
- 33-3164  
Helicopter icing research. Adams, R.I., Workshop on Meteorological and Environmental Inputs to Aviation Systems, 2nd. Proceedings, Knoxville, University of Tennessee Space Institute, 1978, p.139-152. N79-17421 (N79-17413).  
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- 33-3343  
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Soil weathering sequences in Wright Valley. Bockheim, J.G., *Antarctic journal of the United States*, Oct. 1978, 13(4), p.36-39, 7 refs. Weathering, Soils, Alpine glaciation, Alpine soils, Moraines, Antarctica—Wright Valley. Soils in Wright Valley were examined during the 1977-78 field season to establish their relationship to Wright Lower, Wright Upper, and alpine glaciations, and to compare them with soils previously investigated in Taylor Valley. Detailed descriptions were made for 55 profiles. A total of 295 soil samples were collected, and surface weathering features were recorded at 28 localities. A map of Wright Valley gives the location of soil profiles and landforms, and tabular data reflect the soil morphology, surface weathering characteristics, the effects of advances of the Wright Lower Glacier, and correlation of Wright and Taylor Valley soils.
- 33-3345  
Antarctic search for meteorites during the 1977-78 field season. Cassidy, W.A., *Antarctic journal of the United States*, Oct. 1978, 13(4), p.39, 4 refs. Glacier flow, Ablation. Of 310 samples recovered from major bare ice patches along the western side of Allan Hills, 307 were identified as meteorites. One meteorite was found on ice at a field camp located between the eastern and western arms of Allan Hills. It is believed that the collection represents 20 to 50 new finds. The specimens were found for the most part on the upper and lower limbs of an ice monoclone, which may reflect the existence of a near-surface ridge across which the ice is flowing. Data on ice-flow regimes could help in the search for meteorite concentrations. On the other hand knowledge of meteorite concentrations should help to interpret ice-flow regimes and to infer past climate.
- 33-3346  
Ross Sea glaciations: events in Lower Victoria Valley. Borns, H.W., Jr., *Antarctic journal of the United States*, Oct. 1978, 13(4), p.43-44, 3 refs. Glacial geology, Glaciation, Glacial deposits, Antarctica—Victoria Valley. The glacial geology of the Lower Victoria Valley was studied in order to determine whether, and to what extent, lower Victoria Valley had been invaded from the seaward side by ice of the Ross Sea glaciations. The broad distribution of volcanic clasts and apparent lack of in-place young volcanics in the lower Victoria Valley area suggest that a Ross Sea source is the most

reasonable explanation. Preliminary field work suggests that Victoria Lower Glacier has expanded several times and out of phase with at least many of the alpine glaciers that drain into the valley. This evidence, coupled with the elevation of the bedrock beneath the Victoria Lower Glacier and with the presence of scoreaceous basalt clasts in the drift, suggests the possibility that ice of the Ross Sea glaciations moved into Lower Victoria Valley several times. An 18-kg iron meteorite, thought to be the largest yet found in Antarctica, was discovered embedded in the till surface on the north side of the valley floor approx 1 km in front of the Victoria Lower Glacier.

33-3347

**Glacial geologic studies in the McMurdo Sound region.**

Stuiver, M., et al, *Antarctic journal of the United States*, Oct. 1978, 13(4), p.44-45, 7 refs.

Denton, G.H., Kellogg, T.B., Kellogg, D.E.

**Glacial geology, Moraines, Glacial deposits, Drift, Antarctica—McMurdo Sound.**

Glacial geologic studies during the 1977-78 field season included the following projects: mapping surficial deposits in Wright Valley between Wright Lower Glacier and Lake Vanda; collecting additional algal C-14 samples from deltas deposited in Glacial Lake Washburn in Taylor Valley; obtaining a chronology for young, ice-cored moraine ridges that border most glaciers in the McMurdo Sound Region; collecting shells and obtaining initial C-14 dates from the McMurdo Ice Shelf; and examining the glacial geology of the Ruppert and Hobbs Coasts.

33-3348

**Reconnaissance of the glacial geology of Hobbs Coast and Ruppert Coast, Marie Byrd Land.**

Karlén, W., et al, *Antarctic journal of the United States*, Oct. 1978, 13(4), p.46-47, 7 refs.

Melander, O.

**Glacial geology, Striations, Weathering, Glacier oscillation, Antarctica—Marie Byrd Land.**

Examples of striations, weathering, and glacial polish observed during reconnaissance of the glacial geology of Hobbs Coast and Ruppert Coast are discussed. In the Ruppert Coast area striations shown an ice movement mainly toward north and north-west (essentially the same as the present). At a few places striations indicate that an ice movement toward northeast occurred at some time. Directions of the striations in the Hobbs Coast area were also basically the same as the direction of ice movement that now occurs (north and, locally, west). Striations dated at 13 m.y. old have been reported from Boyer Butte. Field observations indicate that glaciers in direct contact with the sea have retreated through calving, while glaciers not in direct contact with the sea show no evidence of a retreat in recent time.

33-3349

**Fixed nitrogen in antarctic ice and snow.**

Parker, B.C., et al, *Antarctic journal of the United States*, Oct. 1978, 13(4), p.47-48, 4 refs.

Zeller, E.J., Harrower, K., Thompson, W.J.

**Ice composition, Snow composition, Firn, Chemical analysis, Ice cores, Antarctica—South Pole.**

Using portions of a 100-m South Pole firn core and snow pit samples, both a short term and long term cyclicity have been identified in the concentrations of nitrate (NO<sub>3</sub>) and ammonium (NH<sub>4</sub><sup>+</sup>) ions. The presence of significant NH<sub>4</sub><sup>+</sup> and absence of detectable nitrite (NO<sub>2</sub>) in clean antarctic firn, ice, and snow had not been previously reported. Several climatic minimums apparently correspond to low NO<sub>3</sub> and NH<sub>4</sub><sup>+</sup> levels generally. A Vostok ice core sample approx 10,000 yr old revealed the highest NO<sub>3</sub> concentration of 525 microg of NO<sub>3</sub>-N per liter. Potential sources of these substances in antarctic snow and ice are being tested.

33-3350

**Ultrasonic measurements on deep ice cores from Antarctica.**

Gow, A.J., et al, *Antarctic journal of the United States*, Oct. 1978, 13(4), MP 1202, p.48-50, 3 refs.

Kohnen, H.

**Ice cores, Ultrasonic tests, Ice crystal structure, Antarctica—Byrd Station.**

This report discusses some results of recent measurements of ultrasonic velocities performed on ice cores collected in 1968 at Byrd Station. The analytical technique is described. It is concluded that measurement of ultrasonic velocities of cores from deep drill holes enables monitoring of the relation characteristics of the cores and determination of the gross trends of c-axis orientation in the ice sheet. Supplemented by optical thin section, studies can verify the exact nature of the fabric at any given depth and any inclination of the fabric symmetry axis with respect to the direction of propagation of P-wave velocity.

33-3351

**905-meter deep core drilling at dome C (East Antarctica) and related surface programs.**

Lorius, C., et al, *Antarctic journal of the United States*, Oct. 1978, 13(4), p.50-51, 8 refs.

Donnou, D.

**Ice cores, Ice composition, Drilling, Ice mechanics, Snow surveys, Antarctica—East Antarctica.**

Using a newly developed electromechanical corer a 905-m core was recovered after drilling at dome C for 42 days. Several operations were carried out along with the drilling: logging and sampling for further laboratory studies, total gas content determinations, crystal size measurements, tests for mechanical properties of the ice, and filtration of the collected meltwater.

*In situ* measurements consisted of diameter and temperature profiles. A surface program was also carried out. It included meteorological observations and atmospheric sulfur dioxide sampling. Snow surface and accumulation studies were conducted, and the 5-m-deep pit was extended down to 8 m for stratigraphy and snow sampling. Shallow coring and temperature measurements were also performed.

33-3352

**Radio echo sounding of the antarctic ice sheet, 1977-78.**

Drewry, D.J., et al, *Antarctic journal of the United States*, Oct. 1978, 13(4), p.52-53, 11 refs.

Meldrum, D.T.

**Radio echo soundings, Ice sheets, Ice shelves, Subglacial observations.**

A total of 141 flight hours were flown during 13 radio echo sounding missions in Antarctica between Jan. 13 and 23, 1978. Sounding was achieved along 25,000 km. Investigations were carried out in the International Antarctic Glaciological Project area, in West Antarctica, and in the Ross Ice Shelf Project area. The first large sub-ice lake in West Antarctica was detected along the western flank of the Ellsworth Mountains. The water body is at least 13 km in extent occupying a bedrock hollow beneath 3,500 m of ice. Several smaller lakes were also identified. Other investigations include studies of layering in East Antarctica; studies of birefringence and thus anisotropy of the dielectric constant of radar wave propagation in ice sheets; sounding behind the McMurdo dry valley area indicating the presence of sub-ice water, moraines, and a local ice surface dome; estimation of the heat flux through the base of an ice sheet; and study of the relative chronology between formation of ice sheets in East and West Antarctica.

33-3353

**Glaciology near Byrd Station.**

Whillans, I.M., *Antarctic journal of the United States*, Oct. 1978, 13(4), p.53-54, 6 refs.

**Ice sheets, Glacier flow, Glacier oscillation, Boreholes, Snow accumulation, Antarctica—Byrd Station.**

The dynamics of ice flow along the Byrd Station strain network, and the interpretation of the Byrd Station core results are discussed. It is found that the ice sheet near Byrd Station has been flowing in a simple, nearly steady-state fashion for some tens of thousands of years. Although the ice sheet is close to steady-state, it is thinning slowly, at a rate of little more than 0.03 m/yr. This is attributed to a warming effect of about 8°C which took place 14,000 yr ago. Because the tilting of the Byrd Station core hold has been measured, it is now possible to model the ice flow and to calculate the depth-age relationship for the core with some reliability. Variations in snow accumulation on the ice sheet near Byrd Station have been analyzed statistically.

33-3354

**Ross Ice Shelf Project 1977-78.**

Clough, J.W., *Antarctic journal of the United States*, Oct. 1978, 13(4), p.54.

**Ice shelves, Research projects, Antarctica—Ross Ice Shelf.**

The 1977-78 Ross Ice Shelf Project (RISP) field season was marked by two major achievements: penetration of the ice shelf at the RISP drill camp J-9 and completion of the Ross Ice Shelf Geophysical and Glaciological Survey (RIGGS).

33-3355

**Access hole drilling through the Ross Ice Shelf.**

Browning, J.A., et al, *Antarctic journal of the United States*, Oct. 1978, 13(4), p.55.

Somerville, D.A.

**Ice shelves, Ice drills, Boreholes, Drilling, Antarctica—Ross Ice Shelf.**

Two access holes were drilled through the 1,380-ft ice thickness of the Ross Ice Shelf, using a flame-jet drill powered by an internal burner whose reactants are compressed air and fuel oil provided at high pressure. The drilling equipment and procedures used are described. The diameter of one of the holes showed large irregularities over the entire hole length. Reasons for the formation of these irregularities are not understood. It is considered doubtful that flame drilling beyond 3,000 ft in solid ice is practical.

33-3356

**Glaciological measurements on the Ross Ice Shelf.**

Thomas, R.H., et al, *Antarctic journal of the United States*, Oct. 1978, 13(4), p.55-56, 6 refs.

MacAyeal, D.R.

**Ice shelves, Strains, Antarctica—Ross Ice Shelf.**

Field work to complete the Ross Ice Shelf Geophysical and Glaciological Survey (RIGGS) was to involve remeasurement of 82 Kehnle-type strain rosettes planted the previous season in a grid pattern on the ice shelf. It was further planned to remeasure detailed strain networks along two 40-km lines near camp C-6 and along a 35-km line on Cray Ice Rise. Precise position fixes were to be made at grid stations using a Geociever. Most of the work was accomplished following major delays.

33-3357

**Ross Ice Shelf Geophysical survey, 1977-1978.**

Greischar, L.L., et al, *Antarctic journal of the United States*, Oct. 1978, 13(4), p.56-59, 11 refs.

Shabtaie, S., Albert, D.G., Bentley, C.R.

**Ice shelves, Geophysical surveys, Sounding, Radar echoes, Electrical resistivity, Antarctica—Ross Ice Shelf.**

The geophysical program on the ice shelf began with gravity and radar sounding profiles and a seismic-surface-wave experiment

at station Q-13. During the last week of Dec., five remote field sites were occupied with support of the Twin Otter airplane. Gravity measurements, radar sounding of ice thickness, and seismic sounding of water depth beneath the ice were made at all sites. In addition, studies of seismic and radio-wave velocities within the ice shelf were made at two of these sites and an electrical resistivity profile was completed at one. Early in Jan. airborne radar sounding was made along 1,800 kilometers of flight lines. The measurements are described.

33-3358

**Antarctic ice core recovery.**

Chiang, E., et al, *Antarctic journal of the United States*, Oct. 1978, 13(4), p.59-61, 9 refs.

Langway, C.C., Jr.

**Ice cores, Ice composition, Ice density, Ice temperature, Ice shelves, Aerosols.**

As part of the Polar Ice Core Analysis Program ice cores were obtained from sites Q-13, C-16, J-9, on the Ross Ice Shelf, and South Pole. These cores and other samples were collected to permit further investigation of the seasonal variation in sea salt concentrations, delineation of aerosol sources by chemical analysis, and assessment of the factors influencing the variations in the physical characteristics of the ice at these and other selected sites. In addition to the ice cores, snow and ice samples were collected from the ice towers near the summit of Mt. Erebus and also on the Ross Ice Shelf for preliminary investigations of the dispersion of aerosols emitted in the Mt. Erebus plume toward the shelf. Surface-to-core tie-in studies were conducted in the vicinity of each site, and measurements were made of core density, stratigraphy, and corehole temperature.

33-3359

**Erebus glacier tongue movement.**

Holdsworth, G., et al, *Antarctic journal of the United States*, Oct. 1978, 13(4), p.61-63, 3 refs.

Holdsworth, R.

**Glacier tongues, Glacier oscillation, Ice deformation, Ice mechanics, Stresses, Antarctica—Erebus Glacier Tongue.**

Ice deformation measurements were made on the Erebus Glacier Tongue, McMurdo Sound, in an attempt to support the hypothesis that, as a result of ocean wave excitation, a floating glacier may oscillate at a frequency that corresponds to one of its higher modes. Under storm conditions with open water, the amplitude and duration of vertical oscillations may be caused by the bending stresses in the resonant-like motion that cause fatigue failure in the ice. Other measurements included density, temperature, ice thickness, and water depth.

33-3360

**Green iceberg samples in the Weddell Sea.**

Amos, A.F., *Antarctic journal of the United States*, Oct. 1978, 13(4), p.63-64, 2 refs.

**Icebergs, Ice composition, Weddell Sea.**

A green and white iceberg was observed and sampled in the eastern Weddell Sea from ARA Isla Orcadas cruise 15 in Feb. 1978. The bulk of the iceberg was comprised of bluish-white, opaque ice that was horizontally stratified but had a rougher top surface than a typical tabular iceberg. The "abnormal" portion of the iceberg was a deep green color, appearing almost black in certain light. The iceberg was estimated to be about 20 m high, 100 m long, and 40 m wide and was tilted at an angle of approximately 35 deg. The green "outcrop" stretched along the entire side that was tilted downward and extended beneath the sea surface. The maximum height of green ice above the surface was approximately 14 m. Results of analyses of the iceberg sample are presented. None of the results so far can be used to postulate an origin for the green iceberg.

33-3361

**Numerical model of antarctic sea ice.**

Parkinson, C.L., et al, *Antarctic journal of the United States*, Oct. 1978, 13(4), p.65-67, 4 refs.

Rayner, J.N.

**Sea ice distribution, Mathematical models, Ice cover thickness.**

A large scale numerical model, developed to simulate the annual cycle of sea ice in the Southern Ocean, is described. The model employs a 41 by 41 rectangular grid with 200-km horizontal resolution, an 8-hr timestep, and four vertical layers: ice, snow, ocean, and atmosphere. Both thermodynamic and dynamic processes are incorporated and there is an allowance for leads. The model is run for a 4-yr simulation period, allowing sufficient time for the yearly cycle to reach an approximate equilibrium. Although the model produces some satisfactory results on a large scale, smaller scale features such as the observed tendency for thicker ice at the northern reaches of the Weddell Sea than at the Weddell Sea coast are generally not reproduced. The results, however, demonstrate the feasibility of including sea ice in global models of the atmosphere and/or oceans.

33-3362

**Continuous surface strain measurements on sea ice and on Erebus Glacier Tongue, McMurdo Sound, Antarctica.**

Goodman, D.J., et al, *Antarctic journal of the United States*, Oct. 1978, 13(4), p.67-70, 12 refs.

Holdsworth, R.

**Sea ice, Glacier tongues, Ice runways, Strains, Ice mechanics, Antarctica—Erebus Glacier Tongue.**

These investigations included measurement of the flexural wave energy on the sea ice close to the Erebus Glacier Tongue, monitoring of the surface strain changes on the glacier itself, and measurement of continuous surface strain (in a frequency range

between 1 hertz and d.c.) close to the annual runway on the sea ice close to McMurdo Station as LC-130 transport planes landed and vehicles passed along the ice road to the runway. Strains were measured continuously to an accuracy of 1 in 100,000,000 strain, over a 5-m gage length with a geophysical wire strainmeter. Typical examples of the data obtained are presented and discussed.

33-3363

**Sea ice and ice algae relationships in the Weddell Sea.** Ackley, S.F., et al, *Antarctic journal of the United States*, Oct. 1978, 13(4), MP 1203, p.70-71, 7 refs. Taguchi, S., Buck, K.R.

**Sea ice, Pack ice, Algae, Cryobiology, Ice breakup, Chemical composition, Weddell Sea.**

Analysis of data obtained during a 1977 cruise in the Weddell Sea indicates that the ice algal community found during that cruise is distinct from others that have been described (for example, the bottom epontic community in the land-fast ice in McMurdo Sound, the surface communities off East Antarctica, and the bottom communities in Arctic Pack ice.) Unlike these other communities, the Weddell pack algae is dominantly an interior one, existing not at the surface or bottom but at mid-depth (65 to 2.15 m) within the ice. The formation of this community is dependent on the unique thermal and physical setting for Weddell sea pack ice. Brine drainage processes are initiated by summer warming, but are not carried through to completion as in the Arctic. This process causes a redistribution of salinity, maximizing in the mid-depth regions of the ice and apparently leading to algae production because of the relatively higher nutrient levels at these mid-depths. A qualitative model indicating the relationship between the thermally induced brine migration and subsequent algae growth is given.

33-3364

**Tritium and carbon-14 distributions in McMurdo Sound, 1977.** Jackson, T.L., et al, *Antarctic journal of the United States*, Oct. 1978, 13(4), p.71-73, 7 refs.

Linick, T.W., Michel, R.L., Williams, P.M.

**Ice composition, Radioactive isotopes, Ice cores, Fall-out, Sea ice, Pack ice.**

Sea waters from McMurdo Sound sampled for tritium and C-14 concentrations, and ice cores of 1-yr-old pack ice from the McMurdo Station sampling site were analyzed for tritium. Data for the samples are tabulated. Biological studies have indicated that water flows northward from under the Ross Ice Shelf on the west side of McMurdo Sound. The highest microbial activity was found at McMurdo Station, and the lowest activity, on the west of the Sound. These investigations indicate that the seawater on the east side of McMurdo may have undergone a more recent interaction with the atmosphere than the west side, causing higher concentrations of bomb-produced radionuclides such as tritium and C-14. Higher concentrations of both radionuclides were found at the McMurdo sampling site. However tritium concentration closer to values found in the west side of McMurdo were found in the open Ross Sea. Thus, other factors, such as snow melt, may influence concentrations at McMurdo. The average tritium concentration for the ice cores was 1.01 tritium units, slightly higher than that found in the McMurdo seawater.

33-3365

**Melting snow in the dry valleys is a source of water for endolithic microorganisms.**

Friedmann, E.I., *Antarctic journal of the United States*, Oct. 1978, 13(4), p.162-163, 10 refs.

**Snow melting, Microbiology, Meltwater, Deserts, Cryobiology.**

The role played by melting snow on endolithic microbial growth on rocks in the antarctic dry valleys has been investigated. Observations suggest that melting snow is a major, or perhaps exclusive, source of water for endolithic microorganisms in the antarctic desert. Like dew in hot deserts, meltwater is available only intermittently; endolithic microorganisms that rely on these water sources periodically undergo stages of desiccation. It appears likely that endolithic microorganisms of the antarctic cold desert are being moistened less frequently than those in hot deserts.

33-3366

**Airborne particles and electric fields near the ground in Antarctica.**

Benninghoff, W.S., et al, *Antarctic journal of the United States*, Oct. 1978, 13(4), p.163-164.

Benninghoff, A.S.

**Aerosols, Particles, Snow composition, Electric fields.**

The kinds, numbers, and deposition of airborne particles within 2 m of the ground were investigated at several antarctic sites. The airborne organic particles, derived from indigenous organisms, were relatively few at Arrival Heights and Lake Vanda, still fewer at McMurdo, and absent at South Pole station. Two categories of introduced organic particles greatly outweighed the numbers of native particles: cells and tissue fragments of conifer wood, and clothing fibers, both natural and synthetic. Snow samples collected at South Pole station contained incompletely burned diesel fuel residue and small quantities of mineral grains as well as conifer wood cells and clothing fibers, all presumably introduced by station activity. Electric field studies suggest that during periods of blowing snow and/or dust, greater numbers of airborne particles would tend to be deposited on wet soil or rock surfaces. This principle may be of basic significance in processes of diaspore lodgment and germination.

33-3367

**Ecosystem comparisons of oasis lakes and soils.**

Parker, B.C., et al, *Antarctic journal of the United States*, Oct. 1978, 13(4), p.168-169, 8 refs.

Simmons, G.M., Jr.

**Lakes, Ecosystems, Meltwater, Limnology, Soils, Antarctica—Victoria Land.**

The objective of this research was to gain an understanding of the interaction between dry valley (oasis) lakes and their associated soil and glacial meltstream ecosystem, and to assess the importance and magnitude of biotic processes influencing the development and evolution of these arctic antarctic lakes. Ten lakes in southern Victoria Land were surveyed during the 1977-78 austral summer. Most of the lakes had a benthic (attached) algal mat community. Wherever foam was collected, it was very high in chlorophyll, ATP, and cell numbers. In deeper arctic and nonmixing lakes such as Bonney, Vanda, Fryxell, and Chad, much of the fluorescence near the saline bottom was pheophytin, suggesting a long history of productivity. In contrast, Miers, Joyce, and Hoare, with relatively fresh bottom water, had little pheophytin. Phosphate in all lakes was scarce relative to certain potential nutrients. Phosphorus-33 uptake data suggest that phosphorus may be the major nutrient limiting productivity in these lakes. The high diversity of algal and microfaunal species from the lakes was unexpected. The first psychrophilic freshwater algae from Antarctica have been obtained. Despite the high concentrations of NO<sub>3</sub> and NH<sub>4</sub> ions in glacial ice and lake water, acetylene reduction studies showed that nitrogen fixation by benthic algal mats takes place.

33-3368

**Atmospheric ice crystals at the South Pole in summer.**

Ohtake, T., *Antarctic journal of the United States*, Oct. 1978, 13(4), p.174-175, 6 refs.

**Ice crystal formation, Precipitation (meteorology), Ice crystal nuclei, Clouds (meteorology), Antarctica—Amundsen-Scott Station.**

The formation mechanisms of atmospheric ice crystals at the South Pole have been studied. The ice crystals formed in three different layers. High clouds (cirrus or cirrostratus) formed 1 mm or larger assembled-bullet ice crystals. Middle clouds (altostratus or altocumulus) created combined ice crystals in the form of side planes, bullets, and columns about 1 mm in size. Ice crystals from both high and middle clouds form and grown in the clouds, then fall out over long distances. The lowest 1,000 m, without visible cloud layer, but sometimes accompanied by fractostratus clouds, created ice crystals in the form of thin hexagonal plates and columns smaller than 0.2 mm. This last kind of ice crystal is the most complicated and forms by water vapor deposition directly onto nuclei under sub-ice saturation conditions. The stepped column ice crystals at South Pole station may result from the freezing of low-level stratus cloud droplets.

33-3369

**Spectroscopic studies at McMurdo, South Pole, and Siple stations during the austral summer 1977-78.**

Kuhn, M., et al, *Antarctic journal of the United States*, Oct. 1978, 13(4), p.178-179, 4 refs.

Siogas, L.

**Albedo, Solar radiation, Reflectivity, Snow surface, Sea ice, Ice surface, Sastrugi, Antarctica—McMurdo Station, Antarctica—Amundsen-Scott Station, Antarctica—Siple Station.**

This project concentrated on the radiative properties of different types of surfaces. Measurements were made of spectral albedo, anisotropic reflectance, and spectral extinction in snow and ice. Typical spectra are shown for albedo measurements taken at McMurdo, South Pole, and Siple stations, and at Canada Glacier of fresh water ice, sea ice, and aged and fresh snow.

33-3370

**Trace elements in the antarctic atmosphere.**

Zoller, W.H., et al, *Antarctic journal of the United States*, Oct. 1978, 13(4), p.187-188, 6 refs.

Cunningham, W.C., McGregor, C., Duce, R.A.

**Snow composition, Aerosols, Ice composition, Atmospheric composition.**

The project described in this article is designed to ascertain the composition of antarctic aerosols and to determine their source. The results will be used to evaluate the relationship of atmospheric aerosol burdens and the composition of snow. Efforts at South Pole Station are concentrating on the collection of particle samples for trace metal analysis and on both particulate and gaseous halogen samples. Radon-222 measurements are also being made daily. The results of chemical analysis of snow samples from the surface and from a 5-m pit will be compared with the atmospheric concentrations of elements measured. A plot of the chemical compositions of the atmosphere and snow from earlier measurements shows agreement within a factor of 3 or 4 for 13 elements determined. These results may indicate that the concentrations of these elements in snow are closely related to atmospheric burdens. Samples of ice were also collected from the summit of Mt. Erebus for analysis of halogens and other trace species.

33-3371

**Gamma ray activity from radioactive fallout at the South Pole.**

Dreschhoff, G., et al, *Antarctic journal of the United States*, Oct. 1978, 13(4), p.193-194, 4 refs.

Zeller, E.

**Fallout, Radioactivity, Snow impurities, Antarctica—South Pole.**

Significant variations in the gamma ray activity at specific levels below the surface were detected in a 4-m-deep pit on the Ross Ice Shelf at Williams Field and in a 5-m-deep pit in Marie Byrd Land. A much more successful test conducted in a 10-m-deep glaciological pit near South Pole Station revealed three individual zones of fallout concentration at depths of 1.4 m, 3.1 m, and 4.4 m. The increased gamma ray activity at these levels is very distinct and amounts to a 5 to 10% increase over the level of the background radiation. Beta activity peaks have been found at the same three locations by laboratory measurements. Each fallout zone can be correlated with a nuclear weapons test series.

33-3372

**Ship operations, Deep Freeze 78.**

Eckman, J.F., *Antarctic journal of the United States*, Oct. 1978, 13(4), p.227-229.

**Icebreakers.**

The itineraries and operations of the icebreakers *Glacier*, *Burton Island*, and *Polar Star*, the cargo ship *Bland*, and the tankship *Maumee* in support of the U.S. Antarctic Research Program are described. The *Glacier* and *Burton Island* furnished support for scientific activities. The channel break into Winter Quarters Bay was accomplished by the *Polar Star*. The *Bland* and *Maumee* provided resupply support. Icebreaker helicopters flew 169 flights in support of science and operations. The *Burton Island* was decommissioned after her return to Oakland, Calif.

33-3373

**Annotated bibliography of "glaciel" studies; morpho-sedimentological aspects. (Bibliographie annotée du glaciologie; aspects morpho-sédimentologiques.)**

Dionne, J.C., *Revue de géographie de Montréal*, 1969, 23(3), p.339-349, In French. Refs. p.340-349.

**Glaciology, Bibliographies, Sediments, Glacial geology, Glacial till, Ice physics, Geomorphology.**

33-3374

**Late-glacial ice-wedge casts north of Québec City. (Fentes de cryoturbation terdglaciaires dans la région de Québec.)**

Dionne, J.C., *Revue de géographie de Montréal*, 1971, 25(3), p.245-264, In French with English and German summaries. 59 refs.

**Ice wedges, Paleoclimatology, Cryogenic formations, Tundra, Moraines.**

33-3375

**Characteristics of erratic boulders along the shores of the St. Lawrence estuary. (Caractéristiques des blocs erratiques des rives de l'estuaire du Saint-Laurent.)**

Dionne, J.C., *Revue de géographie de Montréal*, 1972, 24(2), p.125-152, In French with English and Russian summaries. 39 refs.

**Glacial deposits, Rock mechanics, Glacial till, Paleoclimatology, Shores, Glacial geology, Estuaries.**

33-3376

**Eastward transport of erratics in James Bay area, Québec.**

Dionne, J.C., *Revue de géographie de Montréal*, 1974, 28(4), p.453-457, In English with French summary. 12 refs.

**Rock mechanics, Glacial deposits, Glacier flow, Glaciation, Paleoclimatology, Ice age theory.**

33-3377

**Levels of ammonium, sulfate, chloride, calcium, and sodium in snow and ice from southern Greenland.**

Busenberg, E., et al, *Journal of geophysical research*, Apr. 20, 1979, 84(C4), p.1705-1709, 28 refs.

Langway, C.C., Jr.

**Snow composition, Ice composition, Chemical analysis, Ion density (concentration), Precipitation (meteorology), Acidity, Pollution, Greenland.**

33-3378

**Deformation of pack ice by ridging.**

Bugden, G.L., *Journal of geophysical research*, Apr. 20, 1979, 84(C4), p.1793-1796, 7 refs.

**Ice deformation, Pressure ridges, Pack ice, Ice mechanics, Ice pressure, Sea ice distribution, Analysis (mathematics), Mathematical models.**

33-3379

**Mapping of sea ice and measurement of its drift using aircraft synthetic aperture radar images.**

Leberl, F., et al, *Journal of geophysical research*, Apr. 20, 1979, 84(C4), p.1827-1835, 26 refs.

Bryan, M.L., Elachi, C., Farr, T., Campbell, W.

**Sea ice distribution, Drift, Side looking radar, Radar echoes, Airborne radar, Remote sensing, Sensor mapping.**

- 33-3380  
Temperature fine structure near the sea-ice margin of the Chukchi Sea.  
Paquette, R.G., et al, *Journal of geophysical research*, Mar. 20, 1979, 84(C3), p.1155-1164, 24 refs.  
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- 33-3383  
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- 33-3384  
Breeding cycle and behavior of the semipalmated sandpiper at Barrow, Alaska.  
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DLC GB611.N4  
Meteorology.  
This report contains the formal papers presented at the Polar Meteorology Workshop, held in Reno, Nevada, 6-8 May 1975. The discussion and planning which occurred at the workshop are presented under four principal headings: Climatology and Synoptic Meteorology; The Chemistry of Atmospheric Particulates and Gases and Their Roles in Precipitation Processes; Energy Transfer and Atmospheric Structure; and Facilities and Techniques. The three day workshop was attended by 46 scientists engaged in meteorological research in both north and south polar regions. Critical issues were identified, as were new areas of research need. Recommendations for future research in polar areas are presented, together with explanations and justifications for the provision of specific facilities for the conduct of this research in the Arctic and Antarctic. (Auth.)
- 33-3386  
Role of precipitation processes in chemistry of polar snows.  
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Snow crystals, Snow impurities, Snow composition, Precipitation (meteorology), Antarctica—Ross Ice Shelf.  
Preliminary study of replicated snow crystals in Antarctica indicates that the relative proportions of diffusional and accretional growth change with distance from the ocean, with diffusional processes becoming dominant in the more inland regions. It was proposed that variations in the chemistry of antarctic snow and ice may in part be accounted for by the temporal and spatial distribution of the atmospheric growth mechanisms of snow. These phenomena were investigated at two camps on the Ross Ice Shelf. The first results of analysis comparing relationships between precipitation processes and snow chemistry in time and space are presented in tables. The ratios shown are indicative of normal sea water values for the coastal stations. Further inland the ratios show evidence of enrichment in K and Mg. Apparently significant enrichment is occurring in specific precipitation types and depends on the type, e.g., water droplets, accreted ice crystals, and diffusional growth crystals.
- 33-3387  
Structure and functions of biogeocenoses in the Taymyr tundra. (Struktura i funktsii biogeotsenozov Taymyrskoi tundry).  
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Tomilin, B.A., ed.  
Microclimatology, Tundra soils, Tundra vegetation, Forest tundra, Swamps, Plant ecology, Ecosystems, Plant physiology, Landscape types, Soil profiles, Phenology, Soil microbiology, Algae, Lakes, Bibliographies, USSR—Taymyr Peninsula.
- 33-3388  
Micro- and mesoclimates of Taymyr. (Mikro- i mezoklimaty Taymyra).  
Romanova, E.N., Struktura i funktsii biogeotsenozov Taymyrskoi tundry (Structure and functions of biogeocenoses in the Taymyr tundra) edited by B.A. Tikhomirov and B.A. Tomilin, Leningrad, Nauka, 1978, p.5-29, In Russian. 15 refs.  
Microclimatology, Air temperature, Cryogenic soils, Tundra soils, Solar radiation, Soil temperature, Tundra vegetation, Forest tundra, Swamps, USSR—Taymyr Peninsula.
- 33-3389  
Variations in the composition of soil solutions and some soil properties in the "Tareya" research station during the vegetation period. (Izmeneniye sostava pochvennykh rastvorov i nekotorykh svoystv pochv stantsionara "Tareya" v techeniye vegetatsionnogo perioda).  
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Kolpashchikova, G.A.  
Cryogenic soils, Tundra soils, Swamps, Peat, Tundra vegetation, Soil moisture, Soil composition, Soil chemistry.
- 33-3390  
Seasonal dynamics of Arctic plant increments in the western Taymyr. (Sezonnaya dinamika prirosta arkticheskikh rastenii po nabludeniyam na Zapadnom Taymyre).  
Vital', A.D., Struktura i funktsii biogeotsenozov Taymyrskoi tundry (Structure and functions of biogeocenoses in the Taymyr tundra) edited by B.A. Tikhomirov and B.A. Tomilin, Leningrad, Nauka, 1978, p.58-71, In Russian. 14 refs.  
Tundra soils, Tundra vegetation, Plant ecology, Ecosystems, USSR—Taymyr Peninsula.
- 33-3391  
Vegetation in the vicinity of the Taymyr Biogeocenological Research Station. (Rastitel'nost' okrestnostei Taymyrskogo biogeotsenologicheskogo stantsionara).  
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- 33-3392  
Life forms of vascular plants in the Taymyr Research Station. (Zhiznennyye formy sosudistykh rastenii Taymyrskogo stantsionara).  
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- 33-3393  
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- 33-3394  
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Tundra soils, Tundra vegetation, Plant physiology, Swamps, Ecosystems, Bibliographies, USSR—Taymyr Peninsula.
- 33-3395  
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Tundra vegetation, Microbiology, Algae, Plant ecology, Lakes, Swamps.
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This report presents criteria, engineering information and estimation procedures for the disposal of waste heat associated with the generation of power required to supply the needs of hardened defense underground installations. The major emphasis is placed on the temporary disposal of waste heat below ground while the installation is under attack and cannot rely upon aboveground disposal. A series of sample problems is included to illustrate the use of the estimation procedures presented in the report. All of the sample problems are based on the sizing of a heat sink system for an underground nuclear power plant. Under the design criteria which were assumed for the sample problems, it is shown that the combination ice/water type heat sink concepts provide the most cost effective solutions.
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- 33-3555 Designing highway intersections for complicated geological conditions. (Proektirovanie transportnykh uzlov v slozhnykh geologicheskikh usloviakh), Evgen'ev, I.E., et al, *Avtomobil'nye dorogi*, Feb. 1979, No.2, p.18-19, In Russian. 3 refs.
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- 33-3559 Ice jamming and blocking on the Amudarya River. (Zatory i zachory na r. Amudarya), Mashukov, P.M., Leningrad, Gidrometeoizdat, 1977, 120p., In Russian with English table of contents enclosed. 25 refs.
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- 33-3564 Cartographic work of the Institute of Geography of Siberia and the Far East. (Kartograficheskie raboty instituta geografii Sibiri i Dal'nego Vostoka), Sochava, V.B., Printsipy i metody kartograficheskogo obespecheniia osvoeniia zony BAMa (Principles and methods of mapping for the economic development of the Baykal Amur railroad zone), Irkutsk, 1977, p.3-11, In Russian.
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- 33-3567 Improving winter maintenance of roads. (Puti uluchsheniia zimnego soderzhaniiia avtomobil'nykh dorog), Borodin, G.N., *Avtomobil'nye dorogi*, Mar. 1979, No.3, p.10-12, In Russian.
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- 33-3568 Thermal insulation materials for road pavements. (Teploizoliatsionnye materialy dlia dorozhnykh odezhd), Sukhorukov, I.U.M., *Avtomobil'nye dorogi*, Mar. 1979, No.3, p.18-19, In Russian. 10 refs.
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- 33-3571 Principles and methods of studying forests from satellites. (Printsipy i metody izucheniia lesov iz kosmosa), Isaev, A.S., et al, Aerokosmicheskie issledovaniia Zemli (Satellite surveys of the Earth), Moscow, Nauka, 1979, p.101-105, In Russian.
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- 33-3572 Aerial measurements from satellites for studying land reclamation areas. (Primenenie metodov aerokosmicheskikh izmerenii dlia izucheniia melioriruemnykh zemel'), Golovina, N.N., et al, Aerokosmicheskie issledovaniia Zemli (Satellite surveys of the Earth), Moscow, Nauka, 1979, p.113-127, In Russian. 7 refs.
- Remote sensing, Measuring instruments, Spaceborne photography, Land reclamation, Saline soils, Swamps, Snow cover distribution, Snow water equivalent, Shore erosion, Ice jams, Floods.
- 33-3573 Using spaceborne photography in solving hydrologic problems. (Vodnye problemy i perspektivy ikh resheniia po materialam aerokosmicheskikh s'emoek), Kalinin, G.P., Aerokosmicheskie issledovaniia Zemli (Satellite surveys of the Earth), Moscow, Nauka, 1979, p.130-159, In Russian.
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- Geocryology, Remote sensing, Measuring instruments, Infrared photography, Spaceborne photography, Photointerpretation, Permafrost distribution, Permafrost hydrology, Cryogenic processes, Cryogenic formations.
- 33-3576 Journeys down the line: building the Trans-Alaskan pipeline. (Puti uluchsheniia zimnego soderzhaniiia avtomobil'nykh dorog), Mead, R.D., Garden City, N.Y., Doubleday, 1978, 609p.
- DLC TN879.S.M36 History, Pipelines, Cold weather construction.
- 33-3577 Environmental assessment of the Alaskan continental shelf, Vol.2. Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1979, 542p., Principal investigators' reports October-December 1978. For selected individual reports see 33-3578 through 33-3587.
- Research projects, Ocean currents, Tidal currents, Sea ice, Climate, Shoreline modification, Sediments, Submarine permafrost, Oil spills, Data processing.
- 33-3578 Study of climatic effects on fast ice extent and its seasonal decay along the Beaufort-Chukchi coasts. (Izucheniia klimata i sezonnykh izmeneniiia razmakhov shchitovogo l'da na Beaufort-Chukchinskikh morskikh krayakh), Barry, R.G., Environmental assessment of the Alaskan continental shelf, Vol.2, Principal investigators' reports October-December 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1979, p.33-45.
- Sea ice distribution, Fast ice, Climatic factors.

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Leendertse, J.J. Estuaries, Wind factors, Oil pollution, Wind factors, Water flow, Computerized simulation, Mathematical models.

33-3580

Coastal meteorology of the Alaskan Arctic coast. Kozo, T., Environmental assessment of the Alaskan continental shelf, Vol.2, Principal investigators' reports October-December 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1979, p.184-192.

Wind velocity, Wind direction, Models.

33-3581

Characterization of the nearshore hydrodynamics of an Arctic barrier island-lagoon system. Matthews, J.B., Environmental assessment of the Alaskan continental shelf, Vol.2, Principal investigators' reports October-December 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1979, p.193-201.

Sea ice, Water flow, Ocean currents, Measuring instruments, Water temperature, Salinity.

33-3582

Sediment characteristics, stability, and origin of the barrier island-lagoon system. Naidu, A.S., Environmental assessment of the Alaskan continental shelf, Vol.2, Principal investigators' reports October-December 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1979, p.202-215, 2 refs.

Offshore land forms, Sediment transport, Chemical analysis, Minerals.

33-3583

Environmental geology and geomorphology of the barrier island-lagoon system along the Beaufort Sea coastal plain from Prudhoe Bay to the Colville River. Cannon, P.J., Environmental assessment of the Alaskan continental shelf, Vol.2, Principal investigators' reports October-December 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1979, p.216-223, 2 refs.

Offshore land forms, Shore erosion, Aerial photography, Photointerpretation, Coastal topographic features.

33-3584

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Whitaker, R.E. Oceanography, Offshore land forms, Ocean currents, Mathematical models.

33-3585

Offshore permafrost studies and shoreline history of Chukchi and Beaufort Seas as an aid to predicting offshore permafrost conditions. Hopkins, D.M., Environmental assessment of the Alaskan continental shelf, Vol.2, Principal investigators' reports October-December 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1979, p.280-296, Includes Record of a pre-historic storm surge in the Wainwright Inlet-Kuk River area by Hopkins, R.W. Hartz, and S.W. Robinson as appendix A. 12 refs.

Submarine permafrost, Shoreline modification, Geologic structures, Radioactive age determination.

33-3586

Subsea permafrost probing, thermal regime and data analysis. Osterkamp, T.E., et al, Environmental assessment of the Alaskan continental shelf, Vol.2, Principal investigators' reports October-December 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1979, p.319-399.

Harrison, W.D. Submarine permafrost, Drill core analysis, Thermal regime.

33-3587

Beaufort seacoast permafrost studies. Rogers, J.E., et al, Environmental assessment of the Alaskan continental shelf, Vol.2, Principal investigators' reports October-December 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1979, p.400-408.

Morack, J.L. Submarine permafrost, Seismic refraction, Permafrost indicators, Permafrost depth.

33-3588

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Research projects, Sea ice, Oil spills, Submarine permafrost, Shoreline modification, Shore erosion, Earthquakes, Water chemistry, Seismology.

33-3589

Oil spill vulnerability of the Beaufort Sea coast. Nummedal, D., et al, Environmental assessment of the Alaskan continental shelf, Vol.11, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.1-7, 7 refs.

Fischer, I.A., Knoth, J.S. Ocean waves, Shore erosion, Sediment transport.

33-3590

Interaction of oil with sea ice in the Arctic Ocean. Martin, S., Environmental assessment of the Alaskan continental shelf, Vol.11, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.8-10.

Sea ice, Oil spills, Viscous flow.

33-3591

Dynamics of near-shore ice. Kovacs, A., et al, MP 1205, Environmental assessment of the Alaskan continental shelf, Vol.11, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.11-22.

Weeks, W.F. Sea ice, Drift, Ice cover thickness, Radar echoes, Ice structure, Pressure ridges.

33-3592

Dynamics of near shore ice. Pritchard, R.S., Environmental assessment of the Alaskan continental shelf, Vol.11, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.39-49.

Sea ice, Dynamic properties, Drift, Measuring instruments, Ice mechanics, Ice models.

33-3593

Delineation and engineering characteristics of permafrost beneath the Beaufort Sea. Sellmann, P.V., et al, MP 1206, Environmental assessment of the Alaskan continental shelf, Vol.11, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.50-74.

Chamberlain, E. Submarine permafrost, Bottom sediment, Boreholes, Temperature measurement.

Observations include determinations of subsea sediment temperature, type, ice content, and chemical composition. These data, coupled with geophysical studies and results from other Beaufort Sea geological studies, are being used jointly to ascertain subsea permafrost distribution. This report includes a summary of the spring 1977 field program and a general summation of the results from two years of field study in the Prudhoe Bay area. The 1977 field study produced six additional drilled and sampled holes plus 27 probe sites which yielded both material property and temperature data. The field observations and the results of laboratory analyses of the samples help to demonstrate the complex nature of subsea permafrost.

33-3594

Offshore permafrost studies, Beaufort Sea. Hopkins, D.M., et al, Environmental assessment of the Alaskan continental shelf, Vol.11, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.75-146, Includes as appendixes: Microfossils—benthic foraminifera by K. McDougall; Ostracodes by E. Compton et al; Final report on pollen from borehole PB-2 and Modern pollen rain on the Chukchi and Beaufort Sea coasts, Alaska both by R.E. Nelson.

Hartz, R.W. Submarine permafrost, Boreholes, Temperature measurement, Thermokarst, Marine biology, Fossils, Pollen, Radioactive age determination.

33-3595

Marine environmental problems in the ice covered Beaufort Sea shelf and coastal regions. Barnes, P., et al, Environmental assessment of the Alaskan continental shelf, Vol.11, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.148-299, For attachments to this report see 33-3596 through 33-3599. 8 refs.

Reimnitz, E. Sea ice, Offshore land forms, Ice scoring, Ocean currents, Tidal currents, Bottom topography, Sediment transport.

33-3596

Storm surges in the Alaskan Beaufort Sea. Reimnitz, E., et al, Environmental assessment of the Alaskan continental shelf, Vol.11, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.166-192, 24 refs.

Maurer, D.K. Storms, Wind (meteorology), Sea ice, Wood, Shoreline modification, Ice scoring, Sea level.

33-3597

Ice gouging characteristics: their changing patterns from 1975-1977, Beaufort Sea, Alaska. Barnes, P., et al, Environmental assessment of the Alaskan continental shelf, Vol.11, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.193-229, 16 refs.

McDowell, D., Reimnitz, E. Sea ice, Ice scoring, Bottom sediment.

33-3598

Ice-gouged microrelief on the floor of the eastern Chukchi Sea Alaska: a reconnaissance survey. Toimil, L.J., Environmental assessment of the Alaskan continental shelf, Vol.11, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.230-276, 50 refs.

Ice scoring, Sea ice, Bottom topography, Acoustic measuring instruments, Bottom sediment.

33-3599

Stamukhi shoals of the Arctic—some observations from the Beaufort Sea. Reimnitz, E., et al, Environmental assessment of the Alaskan continental shelf, Vol.11, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.277-299, 8 refs.

Maurer, D.K. Sea ice, Ice deformation, Hummocks, Pressure ridges.

33-3600

Distributions of grain size, total carbon, heavy and light minerals, clay mineralogy, and inorganic geochemistry, outer continental shelf, southern Bering Sea. Gardner, J.V., et al, Environmental assessment of the Alaskan continental shelf, Vol.11, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.300-383, 1 ref.

Vallier, T.L., Dean, W.E., Kvenvolden, K.A., Redden, G.D. Sea water, Water chemistry, Minerals, Particle size distribution, Sediments.

33-3601

**Yukon delta coastal processes study.**  
Dupré, W.R., Environmental assessment of the Alaskan continental shelf, Vol.11, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.384-446, 44 refs.

**Geologic structures, Tides, Permafrost distribution, Shoreline modification, Coastal topographic features, Sea ice.**

33-3602

**Subsea permafrost: probing, thermal regime and data analysis.**

Osterkamp, T.E., et al, Environmental assessment of the Alaskan continental shelf, Vol.11, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.570-650, 23 refs.

**Harrison, W.D. Submarine permafrost, Boreholes, Thermal regime, Salinity, Pile driving, Ground thawing, Settlement (structural).**

33-3603

**Beaufort seacoast permafrost studies.**

Rogers, J.C., et al, Environmental assessment of the Alaskan continental shelf, Vol.11, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.651-688, 19 refs.

**Morack, J.L. Submarine permafrost, Permafrost depth, Permafrost thickness, Seismic refraction.**

33-3604

**Environmental assessment of the Alaskan continental shelf, Vol.12, Hazards. Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, 619p., Principal investigators' annual reports for the year ending March 1978. For selected individual reports see 33-3605 through 33-3618.**

**Research projects, Bottom sediment, Sediment transport, Shoreline modification, Submarine permafrost, Seismology.**

33-3605

**Faulting, sediment instability, erosion, and deposition hazards of the Norton Basin seafloor.**

Nelson, H., Environmental assessment of the Alaskan continental shelf, Vol.12, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.187-307, Includes six separate papers, q.v., 33-3606 through 33-3611. Numerous refs.

**Geologic structures, Bottom sediment, Ice scoring, Gas inclusions, Bottom topography, Ocean currents.**

33-3606

**Report on surface and subsurface faulting in Norton Sound and Chirikov Basin.**

Johnson, J.L., et al, Environmental assessment of the Alaskan continental shelf, Vol.12, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.203-227, 25 refs.

**Holmes, M.L. Acoustic measuring instruments, Seismic reflection, Bottom topography, Geologic structures.**

33-3607

**Identification of thermogenic gas-charged sediment in Norton Basin and potential hazards.**

Nelson, H., et al, Environmental assessment of the Alaskan continental shelf, Vol.12, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.228-245, 17 refs.

**Kvenvolden, K.A., Clukey, E.C. Bottom sediment, Gas inclusions, Acoustic measuring instruments, Drill core analysis.**

33-3608

**Modern biogenic gas-generated craters (sea floor "pockmarks") on the Bering Shelf, Alaska.**

Nelson, H., et al, Environmental assessment of the Alaskan continental shelf, Vol.12, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.246-261, 27 refs.

**Thor, D.R., Sandstrom, M.W. Bottom sediment, Bottom topography, Gas inclusions, Geochemistry.**

33-3609

**Potential hazards of ice gouging over the Norton Basin sea floor.**

Thor, D.R., et al, Environmental assessment of the Alaskan continental shelf, Vol.12, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.262-278, 22 refs.

**Nelson, H., Williams, R.O. Sea ice, Ice scoring, Drift, Wind factors.**

33-3610

**Scour depressions and zones in Norton Sound.**

Larsen, M.C., et al, Environmental assessment of the Alaskan continental shelf, Vol.12, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.279-290, 24 refs.

**Nelson, H., Thor, D.R. Ice scoring, Bottom topography.**

33-3611

**Areas of active, large scale sand wave and ripple fields with scour potential on the Norton Basin sea floor.**

Nelson, H., et al, Environmental assessment of the Alaskan continental shelf, Vol.12, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.291-307, 8 refs.

**Field, M.E., Cacchione, D.A., Drake, D.E. Bottom topography, Ice scoring, Sands.**

33-3612

**Sediment transport in Norton Sound, northern Bering Sea, Alaska.**

Cacchione, D.A., et al, Environmental assessment of the Alaskan continental shelf, Vol.12, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.308-450, Includes the paper New instrument system to investigate sediment dynamics on continental shelves by Cacchione and Drake. 26 refs.

**Drake, D.E. Suspended sediments, Bottom sediment, Sediment transport, Ice cover effect, Ocean currents, Wind factors, Storms.**

33-3613

**Coastal processes and morphology of the Bering Sea coast of Alaska.**

Sallenger, A.H., Jr., et al, Environmental assessment of the Alaskan continental shelf, Vol.12, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.451-502, 11 refs.

**Ocean waves, Shoreline modification, Shore erosion, Ice scoring, Storms, Geomorphology.**

33-3614

**Shoreline history of Chukchi and Beaufort Seas as an aid to predicting offshore permafrost conditions.**

Hopkins, D.M., et al, Environmental assessment of the Alaskan continental shelf, Vol.12, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.503-573, Includes 5 papers as appendices. For three of these see 33-3615 through 33-3617.

**Hartz, R.W. Shores, History, Submarine permafrost, Permafrost forecasting.**

33-3615

**Coastal morphology, coastal erosion, and barrier islands.**

Hopkins, D.M., et al, Environmental assessment of the Alaskan continental shelf, Vol.12, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.508-543, 23 refs.

**Hartz, R.W. Shoreline modification, Shore erosion, Geomorphology, Ice cover effect, Sediment transport, Wind factors, Storms.**

33-3616

**Modern pollen rain on the Chukchi and Beaufort Sea coasts, Alaska.**

Nelson, R.E., Environmental assessment of the Alaskan continental shelf, Vol.12, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.550-558, 6 refs.

**Pollen, Tundra vegetation, Trees (plants).**

33-3617

**Erosional hazards map of the Arctic coast of the National Petroleum Reserve-Alaska.**

Hartz, R.W., Environmental assessment of the Alaskan continental shelf, Vol.12, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.566-573, 12 refs.

**Shore erosion, Shoreline modification, Water waves, Storms, Ground thawing.**

33-3618

**Seismotectonic studies of northeast and western Alaska.**

Biswas, N.N., et al, Environmental assessment of the Alaskan continental shelf, Vol.12, Hazards. Principal investigators' annual reports for the year ending March 1978, Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, 1978, p.575-619, 19 refs.

**Gedney, L. Seismic surveys, Earthquakes.**

33-3619

**Antarctic; Commission reports, Vol.17. (Antarktika; doklady komissii, vypusk 17).**

**Akademiia nauk SSSR. Mezhdudovomstvennaia komissia po izucheniiu Antarkтики, Moscow, Nauka, 1978, 275p., In Russian. Numerous refs. passim. For individual papers see A-21686, A-21687, A-21705, B-21706, C-21702, E-21697 through E-21701, E-21704, F-21695, F-21696, H-21707, H-21708, I-21691, J-21693, K-21688 through K-21690, K-21692, K-21694, K-21709 and L-21703, or 33-3620 through 33-3622.**

**DLC G576.A65**

**Meetings, Research projects, Antarctica.**

This volume comprises papers read at the 2nd All-Union Conference on Antarctic Research, commemorating the 20th year of Soviet activity and international cooperation in the Antarctic. The papers review the most significant findings in the last 20 years, their practical application in exploiting the polar areas, and the direction research should take in the future.

33-3620

**Soviet research in the Southern Ocean. (Itogi sovetskikh issledovaniĭ i Iuzhnom okeane, Treshnikov, A.F., Antarktika; doklady komissii, 1978, No.17, p.82-95, In Russian. 32 refs.**

**Sea ice distribution, Icebergs.**

A history of Soviet Antarctic Expedition work in the Southern Ocean in the last 20 years is given. Over this period 1,500 oceanographical sampling points were used, hundreds of thousands of miles covered by echo sounding, characteristics of surface circulation studied over 35,000 miles, and deep circulation investigated at 26 stations. Bottom sediments were sampled at more than 500 stations and more than 200 measurements taken of sediment depth. Biological studies include more than 4,000 plankton and 400 benthic probes. These data allowed the geographical limits of the Southern Ocean to be established, the frontal zones and bordering seas defined, water masses identified, icebergs classified, sea ice masses located and tracked, and both surface and deep water circulation more completely charted.

33-3621

**Glaciology in Antarctica on the eve of the 1980's. (Gliatsiologiya Antarktidy na rubezhe 80-kh godov XX v.).**

**Kotliakov, V.M., Antarktika; doklady komissii, 1978, No.17, p.111-124, In Russian. 14 refs.**

**Ice sheets, Glaciology, Antarctica.**

Antarctic glaciology in the last 10 years is reviewed. During this time there has been a shift from complex studies carried out by individual countries to international projects. The article discusses the major one: International Antarctic Glaciological Project—its aims, the area under study, methodology, the Soviet role, and main results to date. The disposal of radioactive waste by burying it in Antarctica is considered but rejected. Antarctic mass balance is estimated and some problems affecting precision of such estimates are discussed. The possibilities either of catastrophic collapse of the West Antarctic ice sheet or of massive surges are touched upon. Suggestions for further glaciological research in Antarctica are offered.

33-3622

**Paleogeology in Antarctica. (O probleme paleogeologii Antarktidy).**

**Bardin, V.I., Antarktika; doklady komissii, 1978, No.17, p.125-131, In Russian. 28 refs.**

**Paleoclimatology, Glaciation.**

The results of paleogeological research in Antarctica are reviewed. Studies of the complex of moraines of various ages in Victoria Land, Dronning Maud Land and Mac. Robertson Land have shown definite similarities in main glacial events among these regions and have proved that the East Antarctic ice sheet, at least after it reached its fullest extent, developed as one entity and underwent three great cyclical oscillations. Comparative lithological and morphological descriptions of moraines and glacial sediment dating have led to a correlation of the glacial events in various parts of Antarctica and to an understanding of the general course of East Antarctic Cenozoic glaciation.

33-3623

Methods and instruments for regional seismic surveys in inaccessible areas and their application in Siberia. (Metodika i apparatura dlia regional'nykh seismicheskikh issledovaniĭ v trudnodostupnoi mestnosti i ikh primeneniĭ v Sibiri). Fedynskii, V.V., ed. *Akademiia nauk SSSR. Sibirskoe otdeleniĭ. Institut geologii i geofiziki. Trudy*, 1978, Vol.389, 205p., In Russian with English table of contents enclosed. 149 refs.

Kosminskaja, I.P., ed. Seismic surveys, Permafrost physics, Seismic refraction, Telemetering equipment, Radio communication, Talga terrain, Seismic prospecting.

33-3624

Winter stratification in a lake dominated by through-flow. Bengtsson, L., Luleå, Sweden. *University. Research report*, 1978, TULEA 1978:01, p.24-45, 2 refs. Water temperature, Temperature distribution, Heat flux, Heat transfer, Bottom sediment, Winter.

33-3625

Devices for collecting statistical data of maximum ice-overloads on overhead lines. Paris, L., (Italy), 1970, 8 leaves, Unpublished manuscript. C.I.G.R.E. Study Committee, No.22, W.G. No.6—Safety factors. Power line icing, Ice loads, Ice formation, Ice accretion, Measuring instruments, Statistical data, Wind factors.

33-3626

Origins and ecology of the Sierran alpine flora and vegetation. Chabot, B.F., Durham, N.C., Duke University, 1971, 160p., University Microfilms order No.72-11,076, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, June 1972, p.6862-6863. Alpine vegetation, Plant ecology, Environments.

33-3627

Moisture migration and heat transfer in wet sand during freezing. Gupta, J.P., Philadelphia, University of Pennsylvania, 1971, 162p., University Microfilms order No.72-17,364, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, June 1972, p.7006. Soil freezing, Soil moisture migration, Frozen sand, Heat transfer, Heat flux, Temperature effects, Water content.

33-3628

Processes and rate of development of talus slopes and protalus rock glaciers in the Ogilvie and Wernecke Mountains, Yukon Territory. Gray, J.T., Montreal, P.Q., McGill University, 1971, n.p., Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, June 1972, p.7107. Microfilm from the National Library of Canada. Talus, Rock glaciers, Slope processes, Erosion, Avalanche deposits.

33-3629

Investigation of the low-temperature dynamic-mechanical response of hardened cement paste. Helmuth, R.A., Stanford, Calif., University, 1972, 144p., University Microfilms order No.72-16,726, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, June 1972, p.7153. Cements, Low temperature tests, Elastic properties, Ice formation, Viscosity, Thermal expansion, Amorphous ice, Temperature variations, Dynamic properties, Hardness tests.

33-3630

Statistical analysis of the liquid water distribution in a high altitude snowpack. Carroll, T.R., Boulder, Colorado University, 1977, 86p., University Microfilms order No.77-29,901, N78-17421, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, Jan. 1978, p.3103. Snow water content, Snow hydrology, Snowmelt, Meltwater, Liquid phases, Statistical analysis, Models, Mountains.

33-3631

Influence of ice-crystal size and dispersed-solid inclusions on the creep of polycrystalline ice. Baker, R.W., Minneapolis, Minnesota University, 1977, 111p., University Microfilms order No.7802631, N78-22431, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B; Apr. 1978, p.4688. Ice creep, Ice crystal structure, Ice crystal size, Ice growth, Strain tests, Rheology, Thermal factors.

33-3632

Vegetation organization and fire frequency in the western subarctic. Johnson, E.A., Saskatoon, Canada, University of Saskatchewan, 1977, n.p., Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, Nov. 1978, p.2109-2110. Microfilm from the National Library of Canada. Subarctic vegetation, Forest fires, Revegetation, Mathematical models.

33-3633

Glacial drift characteristics of Minnesota as revealed on Landsat imagery. Goebel, J.E., Lubbock, Texas Technological University, 1978, 147p., University Microfilms order No.7819890, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, Nov. 1978, p.2186. Glacier movement, Glacial till, Glacial geology, Remote sensing, LANDSAT, Photointerpretation.

33-3634

Physical adsorption, contact angle and ice adhesion studies on plastics. Tse, J.T., Los Angeles, University of Southern California, 1978, n.p., Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, Nov. 1978, p.2327. Copies available from Micrographics Dept., Doheny Library, USC, Los Angeles, CA (90007). Ice adhesion, Ice solid interface, Plastics, Adsorption, Wettability.

33-3635

Velocity of sound in supercooled and superheated water. Trinh, E.H.C., New Haven, Conn., Yale University, 1978, 227p., University Microfilms order No.7820807, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, Nov. 1978, p.2353. Supercooled water, Sound transmission, Acoustic properties, Models, Experimental data.

33-3636

Heat and mass transfer in freezing unstratified soil. Jame, Y.-W., Saskatoon, Canada, University of Saskatchewan, 1978, n.p., Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, Nov. 1978, p.2401. Microfilm from the National Library of Canada. Soil freezing, Heat transfer, Mass transfer, Soil moisture migration, Moisture content, Frost heave, Soil temperature, Measuring instruments.

33-3637

Effects of Prudhoe crude oil fractions on the Arctic amphipods *Boeckosimus affinis* and *Gammarus zaddachi*. Busdosh, M., Louisville, Kentucky, University of Louisville, 1978, 124p., University Microfilms order No.7909723, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, May 1979, p.5210. Crude oil, Marine biology, Oil spills, Environmental impact, Limnology, Damage, Animals, Sediments, Arctic regions.

33-3638

Buoy systems for acquiring data in marine environment. Hall, J.M., et al., Offshore Technology Conference, 7th, Houston, Texas, May 5-8, 1975. Proceedings, Vol.2, 1975, p.493-502. Kerut, E.G., Irico, J. Meteorological instruments, Ice conditions, Buoyancy, Drift, Telemetering equipment, Moorings, Marine meteorology.

33-3639

Unique strategy for obtaining wave and wind data in the Gulf of Alaska. McLeod, W.R., et al., Offshore Technology Conference, 7th, Houston, Texas, May 5-8, 1975. Proceedings, Vol.2, 1975, p.503-517. Adamo, L.C., Hamilton, R.C. Meteorological data, Measuring instruments, Water waves, Wind (meteorology), United States—Alaska—Gulf of Alaska.

33-3640

Prediction of the severity of iceberg season in north-west Atlantic Ocean. Murty, T.S., et al., Offshore Technology Conference, 7th, Houston, Texas, May 5-8, 1975. Proceedings, Vol.3, 1975, p.785-794, 12 refs. Bolduc, P.A. Icebergs, Sea ice distribution, Ice conditions, Ice forecasting, Air temperature, Atmospheric pressure, Water temperature, Mathematical models.

33-3641

Soil morphologic and hydraulic changes associated with wastewater irrigation. Simpson, T.W., et al., Pennsylvania State University. *Institute for Research on Land and Water Resources. Research project technical completion report*, Nov. 1978, 212p. PB-291 399. Cunningham, R.L. Water treatment, Waste disposal, Irrigation, Research projects.

33-3642

Modeling and simulation of wastewater reuse systems. Smith, C.L., Louisiana State University. *Department of Chemical Engineering. Report*, Aug. 1978, LSU-WR-AR01, 22p., ADA-062 710, Available in microfiche copies only. Waste disposal, Water treatment, Models, Simulation.

33-3643

Summary of Great Lakes weather and ice conditions, Winter 1976-77. Quinn, F.H., et al., U.S. National Oceanic and Atmospheric Administration. *Technical memorandum*, Oct. 1978, NOAA-TM-ERL-GLERL-20, 155p. PB-292 613. Assel, R.A., Boyce, D.E., Leshkevich, G.A., Snider, C.R. Weather observations, Lake ice, Ice conditions, Spaceborne photography, Icebreakers, Ice cover thickness, Great Lakes.

33-3644

Present state and problems of the investigation of permafrost shores of reservoirs. Are, F.E., U.S. Army Cold Regions Research and Engineering Laboratory, Mar. 1979, TL 714, 13p., ADB-036 864L, 21 refs. Distribution limited to U.S. Government agencies only. For Russian original see 32-440. Reservoirs, Permafrost hydrology, Shore erosion, Shoreline modification, Thermokarst. With increasing development in Siberia has come increased use of natural lakes and construction of artificial lakes in permafrost terrain. The reworking of the shores of these water bodies through thawing of ice in the ground has become a significant engineering factor in their construction and utilization. The basic processes of shoreline reworking are thermokarst (erosion of the underwater part of the shoreline through the thermal and mechanical energy of moving water), thermokarst (subsidence of the lake bottom as a result of thawing), and the thermomodulation (action of thermal energy of the air and solar radiation on the abovewater part of the shoreline). The degree of reworking of shorelines depends greatly on the ice content of the soil, and determining this is difficult. Prediction of the reworking of frozen shorelines suffers from a lack of factual data on 1) the nature and rate of reworking, 2) the morphometry of the shore zone, and 3) the erodability of the permafrost material in different hydrological and geological conditions.

33-3645

Consolidation of cohesionless soils by blasting. Ivanov, P.L., U.S. Army Cold Regions Research and Engineering Laboratory, Mar. 1979, TL 713, 171p., ADB-036 863L, 68 refs. Distribution limited to U.S. Government agencies only. Translation of Izdatel'stvo literat'ury po stroitel'stvu, Leningrad, 1967, p.1-170. Soil stabilization, Soil compacting, Explosion effects, Blasting.

This book gives the basic precepts of the effects of an explosion on water-saturated soil and the processes which occur when cohesionless soil is consolidated, and it gives necessary data concerning the technology of blasting. It examines in detail the methods of consolidating cohesionless water-saturated soil by means of subsurface, surface and underwater blasting. Examples are given of the application of the method for consolidating aggraded sandy soil, the rock beds of harbor facilities, the foundations of hydraulic engineering works, the bases of power lines, and civil-engineering works. An evaluation is given of the area of application of the blasting method of consolidation, its efficiency and technical effectiveness as well as the methods for monitoring consolidation.

33-3646

Calculating the pattern of talik zones and steady temperature fields of rocks beneath water bodies of arbitrary form.

Balobaev, V.T., et al, *U.S. Army Cold Regions Research and Engineering Laboratory*, Mar. 1979, TL 712, 15p., ADB-036 862L, 10 refs. Distribution limited to U.S. Government agencies only. For Russian original see 29-1395.

Shast'evich, I.U.G.

Frozen rocks, Permafrost beneath lakes, Temperature effects, Taliks beneath lakes.

In areas where perennially frozen rock is present beneath a lake basin, talik zones are formed in the frozen strata. The talik zones have different depths and configurations and can be either enclosed or open. Their configuration depends on the surface temperature at the bottom of the lake, and other factors. Since the talik zones are often used as water supplies, for grounding power installations and other industrial purposes, it is necessary to be able to calculate their configuration. This paper presents a method for calculating the stationary temperature field of rock beneath a lake basin of any shape, which can serve as a basis for determining the configuration of the talik zones.

33-3647

Characteristics of the reshaping of shorelines of thermokarst lakes in central Yakutia.

Are, F.E., et al, *U.S. Army Cold Regions Research and Engineering Laboratory*, Mar. 1979, TL 711, 23p., ADB-036 861L, 8 refs. Distribution limited to U.S. Government agencies only. For Russian original see 29-1388.

Balobaev, V.T., Bosikov, N.P.

Thermokarst lakes, Shoreline modification, Shore erosion, Ice cover effect.

The reshaping of the shorelines of thermokarst lakes in Yakutia takes place primarily under the influence of the mechanical energy of waves. Thermal reconstruction of the shorelines is a function of the ice content of the shoreline rock and the water level in the lake. The shorelines of lakes in which the shore runs along the bottom of an alas are stable and can grow. Shorelines running along the slope of the edge of the alas, composed of an ice complex, undergo thermal restructuring leading to shoreline retreat. The intensity of this process does not exceed 1 meter annually.

33-3648

Thermophysical processes in the "frozen soil-water" system during the construction of dams from local materials.

Kuznetsov, A.L., et al, *U.S. Army Cold Regions Research and Engineering Laboratory*, Jan. 1979, TL 701, 17p., ADB-036 860L, 7 refs. Distribution limited to U.S. Government agencies only. For Russian original see 33-1715.

Pekhovich, A.I., Razzgovorova, E.L.

Earth dams, Frozen ground thermodynamics, Ice temperature, Soil freezing, Ground thawing.

In permafrost regions, characterized by harsh climatic conditions and difficult geological conditions with frozen ground, especially when earth which settles when warmed is involved, dams are constructed from local materials of the frozen type. The goal of this paper is to promote the development of a new technique for erecting dams under the conditions which exist in the Far North, using frozen soil without preliminary thawing.

33-3649

LandSat data collection platform at Devil Canyon site, upper Susitna Basin, Alaska—Performance and analysis of data.

Haugen, R.K., et al, *U.S. Army Cold Regions Research and Engineering Laboratory*, Feb. 1979, SR 79-2, 17 refs., ADA-068 508, 7 refs.

Tuinstra, R.L., Slaughter, C.W.

Data transmission, Remote sensing, LANDSAT.

In October 1974, a LandSat Data Collection Platform was installed near the prospective Devil Canyon damsite on the Susitna River, south central Alaska. The development of sensor interfaces and characteristics of transmitted data for air and ground surface temperature, windspeed and wind run, water equivalent snow accumulation, and battery voltage are discussed. Temperature data are analyzed statistically and compared with data from surrounding National Weather Service stations. Although some difficulties were encountered in operation during the winter of 1974-75, it was demonstrated that the LandSat data collection system could provide useful environmental data from a remote, subarctic location in the winter on a near-real-time basis.

33-3650

Effect of water content on the compressibility of snow-water mixtures.

Abele, G., et al, *U.S. Army Cold Regions Research and Engineering Laboratory*, Jan. 1979, CR 79-2, 26p., ADA-066 936, 6 refs.

Haynes, F.D.

Snow water content, Snow compression, Snow density, Snow deformation.

The stress-density relationships of snow-water mixtures were investigated and are shown as functions of water content, initial snow density, initial snow-water mixture density and rate of deformation. An increase in water content in snow at a par-

ticular density or a decrease in the rate of deformation (or strain rate) decreases the stress, but apparently not the specific energy required to reach a specific mixture density.

33-3651

Computer modeling of atmospheric ice accretion.

Ackley, S.F., et al, *U.S. Army Cold Regions Research and Engineering Laboratory*, Mar. 1979, CR 79-4, 36p., ADA-068 582, 25 refs.

Templeton, M.K.

Ice accretion, Meteorological factors, Ice physics, Helicopters.

A computer model is described to compute the amount of ice accretion on an object under a variety of initial conditions. Numerical techniques are best applied to these problems because of time dependent effects governing the amount of ice collected and the variety of initial conditions that can lead to ice accumulation. The helicopter rotor icing problem adds an additional complexity since the velocity along the rotor blade varies over a wide range, strongly affecting the amounts of ice collected at different blade positions. The physics of ice accretion is reviewed, and the accounting for the time-dependence in the computer model is described. Some model results are presented and indicate the dependence of ice accretion on velocity, droplet sizes, cloud liquid water content, and temperature for a cylindrical object of constant size.

33-3652

New land reclamation equipment. (Novaya meliorativnaia tekhnika).

Kamyshentsev, L.A., et al, Moscow, Rossel'khozizdat, 1977, 183p., In Russian with English table of contents enclosed.

Kazakov, V.S., Sokolov, I.U.A.

Land reclamation, Swamps, Drainage, Trenching, Earthwork, Excavating equipment, Frozen ground.

33-3653

High-water structures and regional forecasts of river discharge in the non-chernozem zone of the European USSR. (Struktura polovod'ia i territorial'nye prognozy vesennego stoka rek v nechernozemnoi zone evropeiskoi territorii SSSR).

Subbotin, A.I., Leningrad, Gidrometeoizdat, 1978, 98p., In Russian with English table of contents enclosed. 53 refs.

Floods, Flood forecasting, Rivers, Runoff, Ground water, Snowmelt, Snow water equivalent, Mapping, Charts.

33-3654

Fundamentals of deep roadbed stabilization. (Osnovy glubinnogo zakrepleniia gruntov zemliannogo polotna avtomobil'nykh dorog).

Volotskiĭ, D.V., Moscow, Transport, 1978, 119p., In Russian with English table of contents enclosed. 49 refs.

Roadbeds, Soil stabilization, Frost heave, Slope stability, Cements, Roads.

33-3655

Fundamentals of sagging ground mechanics. (Osnovy mekhaniki prosadochnykh gruntov).

Mustafaev, A.A., Moscow, Stroizdat, 1978, 263p., In Russian with English table of contents enclosed. 220 refs.

Fines, Loess, Soil moisture migration, Soil mechanics, Rheology, Foundations, Settlement (structural), Buildings, Deformation, Design.

33-3656

Summary reports prepared by principal investigators for the Bering Sea-Gulf of Alaska Geological Studies Review Meeting Jan. 31-Feb. 3, 1978, Menlo Park, California. *Bering Sea-Gulf of Alaska newsletter*, May 1978, Vol.3, c65 leaves. These reports, a part of OC-SEAP, are included as Appendix 1 to the Newsletter.

For selected report summaries see 33-3657 through 33-3663.

Research projects, Oil spills, Coastal topographic features, Geology, Sediments, Sea ice, Volcanoes, Earthquakes, Meetings.

33-3657

Coastal morphology, sedimentation and oil spill vulnerability—Gulf of Alaska project summary.

Hayes, M.O., et al, *Bering Sea-Gulf of Alaska newsletter*, May 1978, Vol.3 (Appendix 1). Bering Sea-Gulf of Alaska Geological Studies Review Meeting, Jan. 1978, Menlo Park, Calif. Principal investigators' summary reports, 5 leaves.

Ruby, C.H.

Coastal topographic features, Oil spills, Logistics, Countermeasures.

33-3658

Faults, unstable sediment masses, sediment distribution, and geochemistry of sediments, outer continental shelf, southern Bering Sea.

Vallier, T.L., et al, *Bering Sea-Gulf of Alaska newsletter*, May 1978, Vol.3 (Appendix 1). Bering Sea-Gulf of Alaska Geological Studies Review Meeting, Jan. 1978, Menlo Park, Calif. Principal investigators' summary reports, 8 leaves, 3 refs.

Gardner, J.V., Kvenvolden, K.A., Dean, W.E.

Marine geology, Sedimentation, Seismology, Chemical analysis.

33-3659

Yukon delta coastal processes study.

Dupré, W.R., *Bering Sea-Gulf of Alaska newsletter*, May 1978, Vol.3 (Appendix 1). Bering Sea-Gulf of Alaska Geological Studies Review Meeting, Jan. 1978, Menlo Park, Calif. Principal investigators' summary reports, 4 leaves.

Estuaries, Permafrost distribution, Fast ice, Coastal topographic features, Marine geology.

33-3660

Summary of the eastern Gulf of Alaska environmental program.

Molnia, B.F., et al, *Bering Sea-Gulf of Alaska newsletter*, May 1978, Vol.3 (Appendix 1). Bering Sea-Gulf of Alaska Geological Studies Review Meeting, Jan. 1978, Menlo Park, Calif. Principal investigators' summary reports, 9 leaves. Includes bibliography of project papers as of Jan. 29, 1978.

Carlson, P.R.

Bottom sediment, Marine geology, Geologic processes.

33-3661

Environmental geologic studies in northern Bering Sea.

Nelson, H., et al, *Bering Sea-Gulf of Alaska newsletter*, May 1978, Vol.3 (Appendix 1). Bering Sea-Gulf of Alaska Geological Studies Review Meeting, Jan. 1978, Menlo Park, Calif. Principal investigators' summary reports, 3 leaves, 7 refs.

Thor, D.R.

Marine geology, Sea ice, Ice scoring, Ocean currents, Bottom sediment.

33-3662

Sediment transport in Norton Sound, Alaska.

Cacchione, D.A., et al, *Bering Sea-Gulf of Alaska newsletter*, May 1978, Vol.3 (Appendix 1). Bering Sea-Gulf of Alaska Geological Studies Review Meeting, Jan. 1978, Menlo Park, Calif. Principal investigators' summary reports, 6 leaves, 2 refs.

Drake, D.E.

Sediment transport, Tidal currents.

33-3663

Coastal processes of the Bering Sea coast of Alaska. Sallenger, A.H., et al, *Bering Sea-Gulf of Alaska newsletter*, May 1978, Vol.3 (Appendix 1). Bering Sea-Gulf of Alaska Geological Studies Review Meeting, Jan. 1978, Menlo Park, Calif. Principal investigators' summary reports, 3 leaves.

Dingler, J., Hunter, R.E.

Marine geology, Shoreline modification, Ocean waves, Shore erosion.

33-3664

USA/USSR Symposium on recycling water supply systems and reuse of treated water at industrial plants, 5th, Moscow, Sep. 1977. Washington, D.C., U.S. Environmental Protection Agency, 1978, 64p., PB-289 865, English reprints of the 14 papers presented at the symposium.

Water treatment, Waste disposal, Sewage treatment, Meetings.

33-3665

Thermal conductivity of ice, water and steam.

Engineering Sciences Data Unit, London, England, 1978, 18p. ESDU-78039.

Thermal conductivity, Ice, Water, Steam.

33-3666

Risk assessment and health effects of land application of municipal wastewater and sludges. Proceedings of a conference held in San Antonio, Tex., Dec. 12-14, 1977.

Sagik, B.P., ed. San Antonio, University of Texas, 1977, 344p., PB-289 675, Numerous refs.

Sorber, C.A., ed.

Waste disposal, Water treatment, Waste treatment, Sludges, Irrigation, Health, Meetings.

- 33-3667  
Evaporation of ice in planetary atmospheres: ice covered rivers on Mars.  
Wallace, D., et al, *U.S. National Aeronautics and Space Administration. Contractor report*, Oct. 1978. NASA-CR-157999, 44p., N79-13980, Presented at the 9th Annual meeting of the Division for Planetary Sciences of the American Astronomical Society, Boston, Oct. 29, 1977.  
Sagan, C.  
Planetary environments, Mars (planet), Ice sublimation, Extraterrestrial ice.
- 33-3668  
Ecology and pathology of wildlife in response to spray irrigation of chlorinated effluent. Phase 1.  
Anthony, R.G., et al, *Pennsylvania State University. Institute for Research on Land and Water Resources Research publication*, Aug. 1978, No.189, 187p. PB-289 366.  
Waste disposal, Water treatment, Irrigation, Environmental impact, Animals, Vegetation.
- 33-3669  
On the absorption of solar radiation in a layer of oil beneath a layer of snow.  
Larsen, J.C., et al, *U.S. National Aeronautics and Space Administration. Conference papers*, 1976, NASA-CP-2001-Vol-3, National Aeronautics and Space Administration. Langley Research center. Advances in engineering science, Vol.3, p.1105-1114, N77-10330 (N77-10305).  
Barkstrom B.R.  
Oil spills, Snow cover, Radiation absorption, Models, Solar radiation.
- 33-3670  
Radioglaciology: surface soundings near DYE-3.  
Søndergaard, F., Copenhagen. *Polyteknisk laereanstalt. Laboratoriet for elektromagnetisk feltteori. Report*, Feb. 1975, TUD-D-258, 32p. N76-33603.  
Radio echo soundings, Ice cover thickness, Strain measuring instruments, Greenland.
- 33-3671  
Radioglaciology: soundings near Isua, southwest Greenland.  
Gudmandsen, P., et al, Copenhagen. *Polyteknisk laereanstalt. Laboratoriet for elektromagnetisk feltteori. Report*, Oct. 1974, TUD-D-224, 31p. N76-33601.  
Skou, N., Søndergaard, F.  
Radio echo soundings, Ice cover thickness, Seismic velocity, Greenland.
- 33-3672  
Simulation of heat transfer from a warm pipeline buried in permafrost.  
Wheeler, J.A., 1974, 44 leaves, Manuscript prepared for the 74th national meeting of the American Institute of Chemical Engineers, New Orleans, Louisiana, Mar. 11-15, 1973. 31 refs.  
Permafrost heat transfer, Permafrost preservation, Pipeline insulation, Ground thawing, Refrigerating, Permafrost thermal properties, Hot oil lines, Air temperature, Stefan problem, Snow cover effect, Analysis (mathematics).
- 33-3673  
Geophysical studies in Antarctic waters with the *M.S. Explora*. (Geophysikalische Untersuchungen in antarktischen Gewässern mit "M.S. Explora").  
Hinz, K., *Meeresstechnik*, June 1978, 9(3), p.83-87, In German and English.  
Ice shelves, Ice conditions, Seismic surveys, Ice cover thickness, Bottom sediment, Measuring instruments, Weddell Sea.  
Combined geophysical studies were carried out on board the *Explora* in the Weddell Sea and on the eastern Antarctic continental margin between 67S and 74.2S, 30W and 20E in Jan.-Feb. 1978. Preliminary results are reported on shelf ice conditions, profiles of continental shelf and coastline, using seismic exploration. Magnetic and gravimetric measurements, as well as seismic refraction soundings were performed. Sediments of the Princess Martha coast are briefly discussed.
- 33-3674  
Research and development work in the Division of Mechanical Engineering, 1978.  
National Research Council, Canada. Division of Mechanical Engineering, Ottawa, Ont., 1979, 88p.  
Engineering, Research projects, Railroads, Roads, Marine transportation, Air cushion vehicles, Thermal properties, Oceanography, Ships, Pipelines, Ice cutting, Hydraulic jets, Low temperature research, Aircraft icing.
- 33-3675  
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- A two-stage program for determining the applicability of various remote thermal scanning systems for detecting heat losses in buildings is described. The types of instruments tested are high resolution thermal imaging systems, low resolution thermal imaging systems, thermal line scanners and point radiometers. The first phase of this project consisted of inserting known building defects into a specially designed room at the USA Cold Regions Research and Engineering Laboratory and having a representative of the manufacturer of each type of equipment inspect the room at three temperature differences across the room envelope. The second phase of this project will consist of a field evaluation of these same instruments in approximately 10 cities, in cooperation with a weatherization program for low-income housing sponsored by the Community Services Administration and directed by the National Bureau of Standards. The goal of the second phase is to determine the cost effectiveness of various remote thermal scanning services.
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- Since 1975, CRREL has used hand-held infrared scanners for detecting wet insulation under built-up roof membranes. Thermocouples installed on roofs have shown that temperature differences between areas of wet and dry insulation may exist during both the day and night. The optimum time to detect these differences with an infrared camera is at night when solar interference is eliminated. Surveys have been conducted successfully in many locations from Alabama to Alaska during both warm and cold weather. Three-inch diameter core samples of the roof membrane and insulation have been obtained to verify infrared findings. This paper briefly overviews the technique used to survey roofs for moisture and then presents results of a controlled experiment at Pease AFB, New Hampshire, to show the correlation between thermal images and temperature differences observed thermoelectrically in wet and dry portions of a roof. Measurements of the thermal resistance of the wet and dry areas complete the physical picture.
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Ice sheets, Mass balance, Mass flow, Antarctica—Mizuho Plateau.
- Surveys of a triangulation chain 250 km in length were carried out in 1969 and 1973-1974 along the parallel of 72S in Mizuho Plateau, East Antarctica. Obtained from them were horizontal and vertical components of surface velocities of the ice sheet at 140 stations and parameters of surface strains at 140 triangles of the chain. Local mass budgets at the triangulation stations were deduced from vertical velocities and accumulation rates. General dynamic conditions over Mizuho Plateau were also discussed. Horizontal velocities were small near the Yamato Mountains, while they had a maximum of more than 20 m/a around 39E. The direction of the flow vector was, in general, identical approximately with that of the large-scale maximum slope of the ice surface. Tensile strains predominated mostly over compressive strains, and the direction of the maximum extension was rather close to that of the ice flow. Submergence velocities indicated large values, such as -0.7 to -1 m/a, in the region from 39E eastward. The amount of snow accumulation was not enough in this region to compensate for the deficit of the ice mass caused by the submergence flow. It followed that the local mass budget was negative there. It is suggested from this study that the ice sheet of Mizuho Plateau is in an unsteady state as a whole. (Auth.)
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Research projects, Antarctica.  
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Korotkevich, E.S., Leont'ev, E.B.  
Drift, Ice conditions, Icebreakers, Sea ice, Antarctica—Balleny Islands.  
Ice conditions encountered by the Ob' in antarctic waters from Dec. 1971 to June 1972 are discussed. Information on ice conditions along the heretofore little known Marie Byrd Land coast is given and the effectiveness of icebreakers in this area assessed. Ice features in the Balleny ice field are described. Ice drift data for the Molodetsnaya Station area are presented and several characteristics of the antarctic ice regime in the fall-winter navigation season considered.
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Pack ice, Ice conditions, Ships, Cargo, Antarctica—Leningradskaya Station, Antarctica—Mirny Station.  
Prevailing ice conditions during cargo operations at Mirny and Leningradskaya Station are reviewed. Pack ice parameters such as thickness, snow cover thickness and presence or absence of crevasses are described. Various approaches used by the ships and different routes for the cargo operation to the bases are discussed.
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Snow temperature, Firn, Antarctica—Queen Mary Coast.  
Temperature measurements were taken of the snow-firn layer down to 50 m in three cores drilled at points 49, 57, and 153 km from Mirny on a Vostok-Mirny profile. Temperature at the level below which seasonal temperature changes are not reflected (15 m) was -18.8, -19.3 and -27.7 C respectively. A negative temperature gradient—0.02, 0.03 and 0.015 C/m—was noted. The temperature regime reestablished itself within 5 or 6 days after drilling. Snow-firn layer temperatures drop about 0.8 C per 10 km distance from the coast and 0.9 C per 100 m of absolute altitude.
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Colored snow, Algae, Antarctica—Skarvnes Foreland.  
Some ecological and taxonomic observations were made on the algae of colored snow found in Rumpa and Skarvnes, Antarctica. The recolored snow resulted from the accumulation of a red pigment in algae which was identified as an astaxanthin-like substance. The biomass of colored snow algae was in the range of 160,000-330,000 cells per ml of the melted water. The main components of colored snow algal flora were *Scotiella polyptera*, *Cryptocystis brevispina*, *Chlamydomonas* sp. and *Silicococcus bacillaris*. Cells of *Scotiella* were frequently coated with thin membrane resembling the primary membrane in some Volvoclean zygospores. (Auth. mod.)
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Meetings, River ice, Ice pressure, Hydraulic structures, Heat transfer, Frazil ice, Thermal regime, Models.
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- 33-3773  
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- 33-3776  
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- 33-3777  
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- A comparison of the energy requirements of iceberg towing and seawater desalination indicates that icebergs promise to be a much more economic source of water than desalination. The water would be suitable for domestic and industrial supplies, and perhaps for garden food crops. Feasible methods for protecting and towing the icebergs, and for converting them into water in storage are as yet undeveloped.
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In northern latitudes. (Severnymi shirotami, Malnagashev, B., *Morskoii flot*, 1979, No.3, p.24-26, In Russian.  
Sea ice, Ice navigation, Icebreakers, Ships, Drift stations.
- 33-4034  
Report of decommissioning of the PM-3A Nuclear Power Plant, McMurdo Station, Antarctica. (Foster, M.E., et al, Port Hueneme, California, Naval Nuclear Power Unit, Feb. 1979, var. p., Unpublished manuscript. Refs.  
Jordan, N.M.  
Nuclear reactors, Soil pollution, Radiation, Radioactive wastes, Ice composition, Impurities, Waste disposal, Antarctica—McMurdo Station.  
The PM-3A Nuclear Power Plant, operated from 1962 to 1972 by the Navy under a Memorandum of Understanding between the Atomic Energy Commission and the Department of Defense, has been dismantled and removed from Antarctica, and the site has been decontaminated to levels as low as reasonably achievable. Removal of the plant components and surrounding low-level contaminated rock from the continent was considered prudent in view of the provision in Article V of the Antarctic Treaty that states "...the disposal there of radioactive waste material shall be prohibited". This report shows that the concentrations of man-made radionuclides remaining on the site would result in a radiation dose less than 15 millirems per year as an upper limit or 6 millirems per year as a most probable value. These low doses are the result of the extremely low levels of radionuclides (averaging 8 picocuries per gram of crushed rock for cesium-137, and even less for the other nuclides—cesium-134, cobalt-60, and strontium-90) and the lack of any significant pathway to man in the antarctic environment. The report concludes that the PM-3A decommissioning is complete, and the site may be released for unrestricted use in accordance with United States standards. For individual abstracts see G-14738, G-20496, and G-21855 through G-21857, or 33-4035 and 33-4036. (Auth.)

33-4035

**Radiological survey of the PM-3A site: Volume 1. Final report.**

Jentz, T.L., Rockville, Maryland, NUS Corp., June 1978, 165p., Unpublished manuscript.

**Nuclear reactors, Soil pollution, Radiation, Ice composition, Radioactive wastes, Impurities, Waste disposal, Antarctica—McMurdo Station.**

A complete radiological survey was performed at the PM-3A site at McMurdo Station. This survey included the measurement of soil contamination levels, radiation levels, contamination levels and airborne radioactivity levels. Samples of soil, water and crud were collected for laboratory analysis. The results are presented in charts and graphs. All the TLD environmental packets recorded an equivalent exposure of less than 500 mrem per yr due to reactor produced by-product material. All removable contamination levels in and on the buildings were less than 1000 dpm/100 sq cm. Airborne radioactivity levels in and around the facility were well below the acceptable concentrations in air above natural background for unrestricted areas. Water and ice samples were collected at five locations. Highest tritium levels were found in ice samples collected in the area where liquid radioactive waste was discharged during plant operation.

33-4036

**Radiological survey of the PM-3A site: Volume 2. Final report: Appendix.** Rockville, Maryland, NUS Corp., June 1978, 85p., Unpublished manuscript.

**Nuclear reactors, Soil pollution, Radiation, Ice composition, Impurities, Waste disposal, Antarctica—McMurdo Station.**

This appendix to the radiological survey of the site on which the McMurdo Station nuclear reactor once stood sets forth the procedures for analysis of soil, air particulates, water and crud. A procedure for routine acquisition and processing of gamma-ray spectra using the Ge(Li) detector system is also described. The correct method for reporting results and for checking performance of counting equipment is outlined. Specifications and calibration for the following types of survey equipment are given: PRM-7, Micro-R Meter; PRM-5-3 with SPA-3; PRM-4A or PRM-6 with HP-210 pancake detector; BC-4, beta counter; SAC-4, alpha scaler; and RAS-1, air sampler.

33-4037

**Ocean-atmosphere system.**

Perry, A.H., et al, New York, Longman, Nov. 1977, 160p., Refs.

Walker, J.M.

DLC GC190.2.P47

**Sea ice, Pack ice, Ice shelves, Ice conditions, Air water interactions.**

This book is concerned with interactions between the atmosphere and the oceans and with the interdependence of atmospheric and oceanic circulation. It is intended as a text for second and third year undergraduates in the fields of geography, geophysics, environmental science, marine biology, and nautical studies. The book contains six chapters covering the following topics: the principal features of the ocean-atmosphere system, oceanic macro-circulations, the action of wind on the sea, ocean-atmosphere heat exchange, the thermal behavior of the ocean-atmosphere system and climatic responses, and various international projects and numerical models. The chapter on ocean macro circulations contains discussions on ice conditions, the formation of bottom water, and the significance of deep-water circulations in the Southern Ocean.

33-4038

**Past and present day tropospheric fallout fluxes of Pb, Cd, Cu, Zn and Ag in Antarctica and Greenland.** Boutron, C., *Geophysical research letters*, Mar. 1979, 6(3), p.159-162, 24 refs.

**Fallout, Aerosols, Snow composition, Ice composition, Chemical composition.**

Estimates of the present day tropospheric fallout fluxes of Pb, Cd, Cu, Zn and Ag in the central areas of Antarctica and Greenland are calculated from the measured concentrations of these elements in the deposited snow. The fluxes obtained are higher by one to two orders of magnitude in Greenland, probably largely because of the different geographical locations and meteorological regimes of Greenland and Antarctica. The variations of these fluxes during the last century suggest that the present day enrichments of these five metals in tropospheric aerosols in remote areas are not influenced significantly by human activity, but may be for a small part for Pb and Zn in the Northern Hemisphere, and are therefore linked to natural processes. (Auth.)

33-4039

**Snow transport by katabatic winds in Mizuho Camp area, East Antarctica.**

Kobayashi, S., *Meteorological Society of Japan. Journal*, Apr. 28, 1978, 56(2), p.130-139, 26 refs.

**Snow gages, Wind factors, Wind velocity, Snowdrifts, Antarctica—Mizuho Station.**

This paper describes the results of snow drift measurements made on a slope near Mizuho Camp where katabatic winds prevail. A handy collector, a chest with ten drawers, was devised, to measure the amount of drifting snow under severe conditions in Antarctica. Called a drawer-type collector, it has a collection efficiency of about 0.23 and measures mass fluxes at ten levels up to 1 m above the snow surface at one time. A maximum total drift transport was obtained at each place by integrating the measured and extrapolated mass fluxes from the lowest level to the height of 10 m, as given by an empirical

formula. Using the distribution of wind speed and the relative frequencies of occurrence of drifting and blowing snow at Mizuho Camp and its vicinity, the actual amount of snow transported across a cross-slope line of 1 km in width was obtained, which was about 1 billion kg/km/yr.

33-4040

**Study on ice faulting and icequake activity in Lake Suwa. 2. Temporal variation of m-value.**

Hamaguchi, H., et al, *Tohoku University. Scientific reports. Series V Geophysics*, 1978, 25(1), p.25-38, 18 refs.

Goto, K.

**Ice mechanics, Lake ice, Ice cracks, Ice breakup, Ice cover strength, Ice deformation, Stresses, Fracturing, Japan—Suwa Lake.**

33-4041

**Geotechnical aspects of iceberg scours on ocean floors.**

Chari, T.R., *Canadian geotechnical journal*, May 1979, 16(2), p.379-390.

**Icebergs, Ice scoring, Ocean bottom.**

33-4042

**Undrained strength of some thawed permafrost soils.**

Nixon, J.F., et al, *Canadian geotechnical journal*, May 1979, 16(2), p.420-427, 5 refs.

Hanna, A.J.

**Permafrost physics, Shear strength, Density (mass/volume), Soil mechanics, Soil tests, Canada—Northwest Territories—Mackenzie River Delta.**

33-4043

**Engineering geocryology. Papers prepared for the 3rd International Conference on Permafrost.** (Inzhenernoe merzlotovedenie. Materialy k III Mezhdunarodnoi konferentsii po merzlotovedeniiu.)

Mel'nikov, P.I., ed, Novosibirsk, Nauka, 1979, 300p., In Russian. For individual papers see 33-4044 through 33-4087. Refs. passim.

**Buildings, Foundations, Permafrost bases, Piles, Footings, Supports, Reinforced concrete, Pipelines, Permafrost beneath structures, Permafrost control, Permafrost forecasting, Bridges, Hydraulic structures.**

33-4044

**Interaction of buildings with thawing bearing ground.** (Sovmestnaia rabota zdaniia i ottaivaiushchego osnovaniia).

Pozovskaia, V.G., et al, Inzhenernoe merzlotovedenie. Materialy k III Mezhdunarodnoi konferentsii po merzlotovedeniiu (Engineering geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1979, p.5-16, In Russian. 5 refs.

Neimark, L.I., Vialov, S.S.

**Buildings, Foundations, Ground thawing, Permafrost bases, Settlement (structural), Design.**

33-4045

**Peculiarities of pipeline performance in permafrost in earthquake areas.** (Osobennosti raboty truboprovodov v mnogoletnemerzlykh gruntakh v seismoaktivnykh raionakh).

Spiridonov, V.V., et al, Inzhenernoe merzlotovedenie. Materialy k III Mezhdunarodnoi konferentsii po merzlotovedeniiu (Engineering geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1979, p.16-23, In Russian.

Gekhman, A.S., Figarov, N.G.

**Pipelines, Embankments, Permafrost beneath structures, Earthquakes, Design.**

33-4046

**Methods of calculating centrally loaded pile foundations in frozen ground.** (Metodika rascheta tsentral'no nagruzhennykh svaynykh fundamentov v merzlykh gruntakh).

Khafizov, R.M., et al, Inzhenernoe merzlotovedenie. Materialy k III Mezhdunarodnoi konferentsii po merzlotovedeniiu (Engineering geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1979, p.23-29, In Russian. 4 refs.

Spiridonov, V.V.

**Pile foundations, Permafrost beneath structures, Bearing strength, Design.**

33-4047

**Seasonal variations of electrical resistivities and temperature of frozen rocks and some concepts concerning the mechanism of electrical conductivity in frozen media.** (Sezonnye izmeneniia elektricheskikh soprotivlenii i temperatury merzlykh porod i nekotorye predstavleniia o mekhanizme elektroprovodnosti v merzlykh sredakh).

Akimov, A.T., et al, Inzhenernoe merzlotovedenie. Materialy k III Mezhdunarodnoi konferentsii po merzlotovedeniiu (Engineering geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1979, p.29-33, In Russian. 7 refs.

Kirillov, V.A.

**Permafrost physics, Permafrost thermal properties, Electrical properties.**

33-4048

**Bridge foundations and piers of reinforced concrete piles driven into perennially frozen ground.** (Fundamenty i opory mostov iz zhelezobetonnykh svai-stolbov zaglublennykh v vechnomerzlye grunty).

Silin, K.S., et al, Inzhenernoe merzlotovedenie. Materialy k III Mezhdunarodnoi konferentsii po merzlotovedeniiu (Engineering geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1979, p.34-38, In Russian. 4 refs.

Glotov, N.M.

**Bridges, Piers, Concrete piles, Reinforced concrete, Permafrost beneath structures.**

33-4049

**Role of cryogenic conditions in the design of hydraulic structures.** (Rol' merzlotnykh uslovii v praktike proektirovaniia gidrotekhnicheskikh sooruzhenii).

Krivonogova, N.F., et al, Inzhenernoe merzlotovedenie. Materialy k III Mezhdunarodnoi konferentsii po merzlotovedeniiu (Engineering geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1979, p.38-49, In Russian. 14 refs.

Ziskovich, V.E., Kuznetsov, A.L.

**Hydraulic structures, Permafrost beneath structures, Ground ice, Permafrost structure, Frozen fines, Design.**

33-4050

**Calculating temperature fields in the foundations of structures of arbitrary forms.** (Raschet temperaturnykh poлей v osnovaniakh sooruzhenii proizvol'noi formy).

Kononov, A.A., Inzhenernoe merzlotovedenie. Materialy k III Mezhdunarodnoi konferentsii po merzlotovedeniiu (Engineering geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1979, p.49-58, In Russian. 6 refs.

Foundations, Permafrost beneath structures, Frozen ground temperature, Active layer, Seasonal freeze thaw, Design.

33-4051

**Studying the performance of fluid cooling devices (thermopiles).** (Issledovanie raboty zhidkostnykh okhlazhdaushchikh ustroistv (termosvay)).

Kononov, A.A., et al, Inzhenernoe merzlotovedenie. Materialy k III Mezhdunarodnoi konferentsii po merzlotovedeniiu (Engineering geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1979, p.58-62, In Russian. 7 refs.

Naumova, L.A.

**Permafrost beneath structures, Permafrost control, Thermopiles.**

33-4052

**Application of the reliability theory to the calculation of thermal and mechanical interaction of buildings and structures with permafrost bases.** (Primenenie teorii nadezhnosti k raschetu teplovogo i mekhanicheskogo vzaimodelstviia zdaniia i sooruzhenii s vechnomerzlyimi osnovaniami).

Khrustalev, L.N., et al, Inzhenernoe merzlotovedenie. Materialy k III Mezhdunarodnoi konferentsii po merzlotovedeniiu (Engineering geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1979, p.63-70, In Russian. 10 refs.

Mirenburg, I.U.S.

**Buildings, Permafrost bases, Pile foundations, Active layer, Design.**

33-4053

Calculation of a circular foundation on a plastic frozen base. (Raschet krugovogo v plane fundamenta na plastichno-merzlo osnovanii), Slepak, M.E., Inzhenernoe merzlotovedenie. Materialy k III Mezhdunarodnoi konferentsii po merzlotovedeniiu (Engineering geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1979, p.70-74, In Russian. 8 refs.

Foundations, Permafrost beneath structures, Bearing strength, Settlement (structural), Creep properties.

33-4054

Influence of the material and surface roughness of piles on the frozen ground resistance to shear at lateral surfaces. (Vliianie materiala i sherokhovatosti bokovoi poverkhnosti sval na soprotivlenie sdvigu po nei merzlykh gruntov), Gerasimov, A.S., et al, Inzhenernoe merzlotovedenie. Materialy k III Mezhdunarodnoi konferentsii po merzlotovedeniiu (Engineering geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1979, p.74-77, In Russian. 8 refs.

Dokuchaev, V.V.  
Pile foundations, Permafrost beneath structures, Concrete piles, Surface roughness, Reinforced concrete.

33-4055

Designing foundations of heavy industrial buildings for perennially frozen grounds of West Yakutia. (Osobennosti fundirovaniia tiazhelykh proizvodstvennykh zdaniĭ na vechnomerzlykh gruntakh Zapadnoi IAKutii), Gur'ianov, I.E., Inzhenernoe merzlotovedenie. Materialy k III Mezhdunarodnoi konferentsii po merzlotovedeniiu (Engineering geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1979, p.78-81, In Russian. 5 refs.

Industrial buildings, Foundations, Permafrost beneath structures, Permafrost structure, Ground ice, Bearing strength.

33-4056

Duration of slurry freezing around piles. (Prodolzhitel'nost' smerzaniia grunta so svaiami), Maksimov, G.N., et al, Inzhenernoe merzlotovedenie. Materialy k III Mezhdunarodnoi konferentsii po merzlotovedeniiu (Engineering geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1979, p.81-88, In Russian. 6 refs.

Gavrilov, I.U.E., Khvorostovskaya, N.S.  
Pile foundations, Permafrost beneath structures, Pile driving, Frozen ground temperature, Ground thawing, Heat transfer.

33-4057

Using low-boiling fluid thermopiles as supporting structures. (Ispol'zovanie parozhidkostnykh termosval v kachestve opornykh konstruktiv sooruzhenii), Vialov, S.S., et al, Inzhenernoe merzlotovedenie. Materialy k III Mezhdunarodnoi konferentsii po merzlotovedeniiu (Engineering geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1979, p.88-95, In Russian.

Pile foundations, Supports, Thermopiles, Permafrost beneath structures, Permafrost control.

33-4058

Methods of calculating the stability of tailings in polar regions. (Osobennosti otvalov v Zapoliar'e i metod rascheta ikh ustoiichivosti), Gorodetskii, S.E., et al, Inzhenernoe merzlotovedenie. Materialy k III Mezhdunarodnoi konferentsii po merzlotovedeniiu (Engineering geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1979, p.95-100, In Russian. 5 refs.

Pekarskaia, N.K.  
Mining, Tailings, Slope stability, Cryogenic slope processes, Solifluction.

33-4059

Use of foam plastics in construction on permafrost. (Primenenie penoplastov v stroitel'stve na vechnomerzlykh gruntakh), Ivanov, V.N., et al, Inzhenernoe merzlotovedenie. Materialy k III Mezhdunarodnoi konferentsii po merzlotovedeniiu (Engineering geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1979, p.100-104, In Russian.

Kravchuk, I.I.  
Buildings, Foundations, Pavements, Roads, Airports, Thermal insulation, Cellular plastics, Permafrost beneath structures.

33-4060

Regionalization of permafrost areas according to construction conditions. (Opyt stroitel'nogo racionirovaniia territorii s mnogoletnemrzymymi gruntami), Sukhodol'skii, S.E., et al, Inzhenernoe merzlotovedenie. Materialy k III Mezhdunarodnoi konferentsii po merzlotovedeniiu (Engineering geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1979, p.104-108, In Russian.

Khrustalev, L.N.  
Permafrost distribution, Frozen fines, Thermokarst, Cryogenic slope processes, Mapping, Construction costs.

33-4061

Crystallization of supercooled water and formation of the crystallization electric potentials in some aqueous solutions. (Kristallizatsiia pereokhlazhdennoi vody, vzniknovenie kristallizatsionnykh elektricheskikh potentsialov v nekotorykh vodnykh rastvorakh), Kachurin, L.G., Inzhenernoe merzlotovedenie. Materialy k III Mezhdunarodnoi konferentsii po merzlotovedeniiu (Engineering geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1979, p.109-115, In Russian. 24 refs.

Supercooled water, Phase transformations, Ice nuclei, Crystallization, Electric potential, Bibliographies.

33-4062

Ice failure under short-term creep conditions. (Razrushenie l'da v usloviakh kratkovremennoi polzuchestii), Zaretskii, I.U.K., et al, Inzhenernoe merzlotovedenie. Materialy k III Mezhdunarodnoi konferentsii po merzlotovedeniiu (Engineering geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1979, p.115-127, In Russian. 6 refs.

Ice strength, Loads (forces), Creep properties, Ice crystal structure, Ice crystal size.

33-4063

NMR technique of studying phase composition of water in frozen fines. (Nekotorye rezul'taty issledovaniia fazovogo sostava vody v merzlykh tonkodispersnykh gornykh porodakh metodom IAMR), Ananian, A.A., et al, Inzhenernoe merzlotovedenie. Materialy k III Mezhdunarodnoi konferentsii po merzlotovedeniiu (Engineering geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1979, p.128-133, In Russian. 10 refs.

Volkova, E.V., Golovanova, G.F.  
Frozen fines, Clays, Unfrozen water content, Phase transformations, Nuclear magnetic resonance.

33-4064

Shear strength of frozen slurry at the contact with a high ice content ground. (O soprotivlenii sdvigu merzlogo gruntovogo rastvora na kontakte s sil'noi distym gruntom), Sadovskii, A.V., et al, Inzhenernoe merzlotovedenie. Materialy k III Mezhdunarodnoi konferentsii po merzlotovedeniiu (Engineering geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1979, p.133-137, In Russian. 4 refs.

Tikhomirov, S.M.  
Pile foundations, Permafrost beneath structures, Ground ice, Shear strength.

33-4065

Experimental study of moisture transfer in porous rocks during freezing. (Eksperimental'noe izuchenie migratsii vlagi v poluskal'nykh gornykh porodakh pri ikh promerzaniĭ), Vasil'ev, A.A., et al, Inzhenernoe merzlotovedenie. Materialy k III Mezhdunarodnoi konferentsii po merzlotovedeniiu (Engineering geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1979, p.137-141, In Russian. 3 refs.

Zil'berbord, A.F.  
Frozen rocks, Porosity, Moisture transfer, Frost penetration.

33-4066

Studying moisture migration near the frost penetration boundary. (Issledovanie migratsii vlagi vblizi granitsy promerzaniia), Chistotinov, L.V., Inzhenernoe merzlotovedenie. Materialy k III Mezhdunarodnoi konferentsii po merzlotovedeniiu (Engineering geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1979, p.141-145, In Russian. 2 refs.

Soil freezing, Frost penetration, Soil moisture migration, Phase transformations, Frozen ground temperature, Unfrozen water content.

33-4067

Ice formation under pressure in natural conditions. (Ledobrazovanie pod davleniem v prirode), Pekhovich, A.I., et al, Inzhenernoe merzlotovedenie. Materialy k III Mezhdunarodnoi konferentsii po merzlotovedeniiu (Engineering geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1979, p.145-149, In Russian. 3 refs.

Razgovorova, E.L.  
Pngos, Ice veins, Ice formation, Soil formation, Soil pressure, Naleds, Ice pressure, Ice growth.

33-4068

Unfrozen water in frozen rocks. (Nezamerzshaia voda v merzlykh gornykh porodakh), Akimov, I.U.P., et al, Inzhenernoe merzlotovedenie. Materialy k III Mezhdunarodnoi konferentsii po merzlotovedeniiu (Engineering geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1979, p.149-152, In Russian. 9 refs.

Cheverev, V.G.  
Frozen rocks, Cryogenic structures, Porosity, Moisture transfer, Unfrozen water content.

33-4069

Studying the possibility of using saline perennially frozen grounds as bases for buildings and structures. (Issledovaniia zasolennykh vechnomerzlykh gruntov v tseliakh ikh ispol'zovaniia v kachestve osnovanii zdaniĭ i sooruzhenii), Velli, I.U.IA., et al, Inzhenernoe merzlotovedenie. Materialy k III Mezhdunarodnoi konferentsii po merzlotovedeniiu (Engineering geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1979, p.152-163, In Russian. 7 refs.

Aksenov, V.I.  
Buildings, Permafrost bases, Saline soils, Ground ice, Frozen fines, Foundations, Frozen ground temperature, Bearing strength.

33-4070

Influence of loading conditions on mechanical properties of frozen ground. (Vliianie rezhima zagruzheniia na mekhanicheskie svoistva merzlykh gruntov), Pekarskaia, N.K., Inzhenernoe merzlotovedenie. Materialy k III Mezhdunarodnoi konferentsii po merzlotovedeniiu (Engineering geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1979, p.163-174, In Russian. 16 refs.

Frozen fines, Frozen ground mechanics, Ground ice, Deformation, Frozen ground strength, Creep properties, Impact tests, High pressure tests.

- 33-4071**  
New method of determining mechanical properties of permafrost under natural conditions. (Novyi metod opredeleniia mekhanicheskikh kh. i kriteristik vechnomerzlykh porod v usloviakh estestvennogo zaleganiia). Kubetskii, V.L., Inzhenernoe merzlotovedenie. Materialy k III Mezhdunarodnoi konferentsii po merzlotovedeniiu (Engineering geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1979, p.174-179, In Russian. 8 refs.
- 33-4072**  
Development of frozen ground deformations in time. (Razvitiie vo vremeni deformatsii merzlykh gruntov). Slepak, M.E., et al., Inzhenernoe merzlotovedenie. Materialy k III Mezhdunarodnoi konferentsii po merzlotovedeniiu (Engineering geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1979, p.179-182, In Russian. 2 refs.
- 33-4073**  
Frozen ground mechanics, Creep properties, Creep rate, Analysis (mathematics). Vialov, S.S.
- 33-4074**  
Quantitative evaluation of permafrost strength indices from positions of the kinetic theory of strength. (Kolichestvennaia otsenka prochnostnykh pokazatelei vechnomerzlykh gruntov s pozitsii kineticheskoi teorii prochnosti). Kononov, A.A., et al., Inzhenernoe merzlotovedenie. Materialy k III Mezhdunarodnoi konferentsii po merzlotovedeniiu (Engineering geocryology. Papers prepared for the 3rd International Conference on Permafrost) edited by P.I. Mel'nikov, Novosibirsk, Nauka, 1979, p.182-188, In Russian. 4 refs.
- 33-4075**  
Foundations, Permafrost bases, Compressive strength, Frozen ground temperature. Roman, L.T.
- 33-4076**  
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Avalanches, Snow surveys, Mapping, Norway.
- 33-4188**  
Probability of avalanche forecasts in the Pskem River basin, based on aerial photographs taken in winter and spring. (Veroiatnost' otsenki lavinnoi opasnosti po materialam zimnikh i vesennikh aerofotos'emok na primere basseina r. Pskem). Kondakova, N.L., Snezhnye laviny (prognoz i zashchita) (Snow avalanches (forecasts and countermeasures)) edited by G.K. Tushinskiĭ and E.S. Troshkina, Moscow, Universitet, 1974, p.82-98, In Russian. 5 refs.  
DLC QC929.A8S63  
Avalanche forecasting, Snow cover distribution, Snow surveys, Aerial photography, Photointerpretation.
- 33-4189**  
Using dendrochronology in studying variations in avalanche activity over a period of years. (K metodike dendrokronologicheskikh issledovaniĭ dlia otsenki mnogoletnikh kolebaniĭ lavinnoi aktivnosti). Svetlosanov, V.A., et al, Snezhnye laviny (prognoz i zashchita) (Snow avalanches (forecasts and countermeasures)) edited by G.K. Tushinskiĭ and E.S. Troshkina, Moscow, Universitet, 1974, p.99-103, In Russian. 2 refs.  
Luk'ianova, L.M., Miagkov, S.M.  
DLC QC929.A8S63  
Avalanches, Paleoclimatology, Snowfall, Climatic changes, Trees (plants), Age determination, Mathematical analysis.
- 33-4190**  
Experimentation with stereophotogrammetric macrophotography of snow crystals. (Opyty po stereofotogrammetricheskoi makros'emki kristallov snega). Knizhnikov, I.U.F., et al, Snezhnye laviny (prognoz i zashchita) (Snow avalanches (forecasts and countermeasures)) edited by G.K. Tushinskiĭ and E.S. Troshkina, Moscow, Universitet, 1974, p.104-117, In Russian.  
Troshkina, E.S.  
DLC QC929.A8S63  
Snow crystals, Ice crystals, Stereophotography, Stereoscopic cameras, Laboratory techniques.
- 33-4191**  
Sensors for recording physical parameters and processes in avalanche foci. (Datchiki dlia registratsii fizicheskikh parametrov i protsessov v lavinnnykh ochagakh). Berni, B.L., et al, Snezhnye laviny (prognoz i zashchita) (Snow avalanches (forecasts and countermeasures)) edited by G.K. Tushinskiĭ and E.S. Troshkina, Moscow, Universitet, 1974, p.118-124, In Russian. 2 refs.  
Sukhanov, L.A.  
DLC QC929.A8S63  
Avalanche forecasting, Avalanche formation, Snow depth, Snow density, Snow water content, Avalanche mechanics, Monitors, Telemetering equipment.
- 33-4192**  
Creep and compaction of snow. (Polzuchest' i uplotnenie snega). Volkovskiĭ, K.F., Snezhnye laviny (prognoz i zashchita) (Snow avalanches (forecasts and countermeasures)) edited by G.K. Tushinskiĭ and E.S. Troshkina, Moscow, Universitet, 1974, p.125-132, In Russian. 2 refs.  
DLC QC929.A8S63  
Avalanches, Metamorphism (snow), Snow creep, Snow compaction, Snow crystals, Plastic deformation.

33-4193

Experimental determination of slowly sliding snow pressure on avalanche protection structures. (Eksperimental'noe opredelenie daviel'nii medlenno spoliashchego snega na protivolavinnye sooruzheniya, Volkovskii, K.F., et al, Snezhnye laviny (prognoz i zashchita) (Snow avalanches (forecasts and countermeasures)) edited by G.K. Tushinskii and E.S. Troshkina, Moscow, Universitet, 1974, p.133-157, In Russian. 10 refs.

Zhigul'skii, A.A.

DLC QC929.A8563

Avalanche engineering, Avalanche countermeasures, Snow retention, Steel structures, Snow creep, Snow loads.

33-4194

Mounted sectional latticed avalanche protection structures. (Podvesnoi sbornyi lavinogastel'), Volkovskii, K.F., et al, Snezhnye laviny (prognoz i zashchita) (Snow avalanches (forecasts and countermeasures)) edited by G.K. Tushinskii and E.S. Troshkina, Moscow, Universitet, 1974, p.158-165, In Russian. 3 refs.

El'mesov, A.M., Kherkheulidze, I.I.

DLC QC929.A8563

Avalanche engineering, Avalanche countermeasures, Latticed structures, Concrete structures, Prefabrication, Avalanche velocities, Avalanche pressure.

33-4195

Experience of constructing buildings with foundations on fill.

Tishin, V.G., *Soil mechanics and foundation engineering*, Nov-Dec. 1978, 15(6), p.381-384, Translated from Osnovaniia, fundamenti i mekhanika gruntov. 2 refs.

Buildings, Foundations, Rock fills, Frost heave, Seasonal freeze thaw.

33-4196

Characteristics of deep roasting of soils and prospects of its improvement.

Iur'danov, A.P., *Soil mechanics and foundation engineering*, Nov-Dec. 1978, 15(6), p.397-401, Translated from Osnovaniia, fundamenti i mekhanika gruntov. 5 refs.

Loess, Foundations, Soil stabilization, Heating.

33-4197

Relation between the defect distribution and stresses. The glacier motion.

Teisseyre, R., *Acta geophysica polonica*, 1978, No.4, p.283-290, With Polish summary. 6 refs.

Glacier movement, Glacier ice, Stresses, Defects, Dislocations (materials).

33-4198

Physico-chemical investigations of concretes and their components. (Fiziko-khimicheskie issledovaniia betonov i ikh sostavliaushchikh, Krasil'nikov, K.G., ed, Moscow, Nauchno-issledovatel'skii institut betona i zhelezobetona, Trudy, 1975, Vol.17, Moscow, Stroizdat, 1975, 181p., In Russian. For selected papers see 33-4199 through 33-4202. Refs. passim.

DLC TP882.3.F58

Winter concreting, Concrete freezing, Frost penetration, Concrete hardening, Cements, Concrete aggregates, Concrete strength, Frost resistance.

33-4199

Formation of contact zones between cement stone and aggregates during concrete hardening at different temperatures. (Formirovanie kontaktnoi zony tsementnogo kamnia s zapolniteliami pri tverdenii betonov v razlichnykh temperaturnykh usloviakh, IArushkina, S.Kh., Fiziko-khimicheskie issledovaniia betonov i ikh sostavliaushchikh (Physico-chemical investigations of concretes and their components) edited by K.G. Krasil'nikov, Moscow, Stroizdat, 1975, p.88-99, In Russian. 10 refs.

Winter concreting, Concrete freezing, Concrete hardening, Cements, Concrete aggregates.

33-4200

Phase transitions of water to ice to water in cement stone pores and concrete. (Fazovye perekhody vodaled v porakh tsementnogo kamnia i betona, Krasil'nikov, K.G., et al, Fiziko-khimicheskie issledovaniia betonov i ikh sostavliaushchikh (Physico-chemical investigations of concretes and their components) edited by K.G. Krasil'nikov, Moscow, Stroizdat, 1975, p.100-107, In Russian. 7 refs.

Tarasov, A.F.

Concrete freezing, Frost penetration, Moisture, Phase transformations, Ice formation, Freeze thaw cycles, Frost resistance.

33-4201

Studying cement stone and concrete for construction in the North. (Issledovanie tsementnogo kamnia i betona dlia stroitel'stva v raionakh Severa, Koketkina, A.I., et al, Fiziko-khimicheskie issledovaniia betonov i ikh sostavliaushchikh (Physico-chemical investigations of concretes and their components) edited by K.G. Krasil'nikov, Moscow, Stroizdat, 1975, p.128-135, In Russian. 2 refs.

Bugrim, S.F., Larionova, Z.M.

Concrete strength, Frost resistance, Winter concreting, Concrete placing, Concrete hardening, Concrete freezing, Cements.

33-4202

Dilatometric and calorimetric assemblies for studying ice content and deformation of cement stone during freezing. (Dilatometricheskaia i kalorimetricheskaia ustanovki dlia issledovaniia deformatsii i distosti tsementnogo kamnia pri ego zamorazhivani, Tarasov, A.F., Fiziko-khimicheskie issledovaniia betonov i ikh sostavliaushchikh (Physico-chemical investigations of concretes and their components) edited by K.G. Krasil'nikov, Moscow, Stroizdat, 1975, p.136-145, In Russian. 11 refs.

Concrete strength, Frost resistance, Measuring instruments, Concrete freezing, Ice formation, Cements, Test equipment.

33-4203

Durability of construction materials and structures. (Dolgovechnost' stroitel'nykh konstruktov i materialov, Rokhlin, I.A., ed, Kiev, Budivelnik, 1978, 78p., In Russian with English table of contents enclosed. 49 refs.

Kuznetsov, I.U.D., ed.

Concrete structures, Reinforced concrete, Cements, Frost resistance, Concrete freezing, Cellular concretes.

33-4204

Ultrasonic velocity investigations of crystal anisotropy in deep ice cores from Antarctica.

Kohnen, H., et al, *U.S. Army Cold Regions Research and Engineering Laboratory*, May 1979, CR 79-10, 16p., ADA-071 451, 23 refs.

Gow, A.J.

Ice sheets, Glacier flow, Ice cores, Ice crystal structure, Ice acoustics, Anisotropy, Wave propagation, Ultrasonic tests, Ice crystal size, Shear properties, Antarctica—Byrd Station, Antarctica—Little America Station.

Ice cores from Byrd Station and Little America V have been used to test an ultrasonic technique for evaluating crystal anisotropy in the Antarctic Ice Sheet. P-wave velocities measured parallel and perpendicular to the vertical axes of cores from the 2164-m-thick ice sheet at Byrd Station have yielded results in excellent agreement with the observed c-axis fabric profile and with the in-situ P-wave velocity profile measured parallel to the bore hole axis. Velocity differences in excess of 140 m/s for core samples from deeper than 1300 m attest to the strong single pole clustering of crystallographic c-axes about the vertical, especially in the zone from 1300-1800 m. Such oriented structure is compatible only with strong horizontal shearing in the zone. The existence in an ice sheet of widespread shearing several hundred meters above its bed raises serious questions as to the validity of current concepts of the flow of large ice masses that tend to gloss over or ignore crystal alignments of this magnitude. The ultrasonic technique has proven to be a fast and powerful tool for determining crystal fabrics in ice sheets. Results from Byrd Station and Little America V, together with fabric data from several other locations in East Antarctica, suggest that crystal orientations within the Antarctic Ice Sheet tend to be characterized by either single or multi-pole clustering of c-axes about a vertical symmetry axis.

33-4205

Permafrost and the economic development of mountainous regions and lowlands (the Magadan area and Yakut ASSR taken as examples). (Vechnaia merzloti i osvoenie gornyykh stran i nizmennostei (na primere Magadanskoi oblasti i Iakutskoi ASSR), Tomirdiario, S.V., Magadanskoe knizhnoe izd-vo, 1972, 174p., In Russian with English summary enclosed. Refs. p.169-172.

Permafrost origin, Permafrost structure, Ground ice, Ice veins, Ice structure, Land reclamation, Thermokarst lakes, Cryogenic soils, Shoreline modification, Alas, Loess, Permafrost hydrology.

33-4206

At low temperatures. (V usloviakh nizkikh temperatur, Faustov, M., et al, *Tekhnika i vooruzhenie*, Feb. 1979, No.2, p.24-25, In Russian.

Mikhalev, G.

Military equipment, Military transportation, Cold weather performance, Winter maintenance.

33-4207

Automatic cold chamber for testing frost resistance of construction materials. (Avtomatizirovannai morozil'naia kamera dlia ispytaniia stroitel'nykh materialov na morozostoi'kost'), On'kov, N.P., *Stroitel'nye materialy*, Feb. 1979, No.2, p.12, In Russian.

Construction materials, Frost resistance, Cold chambers, Test equipment.

33-4208

Determining lateral loads on temporary timbering of mine shafts during non-uniform thawing of rocks. (Opredelenie poperechnoi nagruzki na vremennuiu krep' shakhtnogo stvola pri neravnom ottaivani boko-vykh porod, Nadezhdin, A.V., et al, *Shakhtnoe stroitel'stvo*, Dec. 1978, No.12, p.17-18, In Russian. 2 refs.

Sedin, V.A.

Mining, Shaft sinking, Ground thawing, Timbering (supporting), Design.

33-4209

Very deep artificial freezing of rocks for shaft sinking in Poland. (Zamorazhivanie porod na bol'shie glubiny pri prokhodke stvolov shakht v PNR, Gulei, I.M., *Shakhtnoe stroitel'stvo*, Mar. 1979, No.3, p.29-30, In Russian.

Mining, Shaft sinking, Artificial freezing.

33-4210

Supporting walls and slopes of baked cohesive earth. (Podpornye steny i otkosy iz obozhzhennykh svyaznykh gruntov, Iur'danov, A.P., *Promyshlennoe stroitel'stvo*, Mar. 1979, No.3, p.28-29, In Russian.

Slopes, Soil compacting, Heating, Soil stabilization, Retaining walls.

33-4211

Niogrin prevents freezing of coal cargo. (Niogrin prepiastvuet smerzaniu energeticheskikh uglei, Medvedeva, V.I.A., et al, *Promyshlennyy transport*, Feb. 1979, No.2, p.21, In Russian.

Frozen cargo, Coal, Frost protection, Antifreezes.

33-4212

High quality subgrades for the Baykal Amur railroad. (Zemliannomu polotnu BAM-vysokoe kachestvo, Put' i putevoe khoziaistvo, 1979, No.2, p.15-16, In Russian.

Subgrades, Embankments, Permafrost beneath structures, Permafrost control, Baykal Amur railroad.

33-4213

Determining ultimate strength of frozen ground. (Opredelenie predela prochnosti merylykh gruntov, Valiakhmetov, D.G., et al, *Stroitel'nye i dorozhnye mashiny*, Jan. 1979, No.1, p.20-21, In Russian. 4 refs.

Pavlov, V.N.

Earthwork, Excavating equipment, Frozen ground strength.

33-4214

Experimental-industrial tests of a chemical method of sand-clay rock cementation. (Opytno-promyshlennai proverka khimicheskogo metoda zakrepleniia peschano-glinistykh porod, Basinskii, V.G., et al, *Russia. Ministerstvo vysshego i srednego spetsial'nogo obrazovaniia. Izvestiia vysshikh uchebnykh zavedenii. Geologiya i razvedka*, Feb. 1979, No.2, p.144-146, In Russian.

Orlov, A.V.

Mining, Sands, Clays, Rock excavation, Cements, Silication.

33-4215

Digging trenches in freezing weather. (Otryvka okopov zimoi, Gusev, V., *Voennyi vestnik*, Dec. 1978, No.12, p.100-101, In Russian.

Military engineering, Trenching, Frozen ground, Military operation.

33-4216

Application of the active optical location method to snow melting control. (O vozmozhnosti primeneniia metoda aktivnoi opticheskoi lokatsii dlia kontroliia za protsessom taniia snega, Kropotkin, M.A., et al, *Vodnye resursy*, 1979, No.3, p.184-187, In Russian. 4 refs.

Dmitriev, G.A., Sheveleva, T.I.U.

Snow surface, Albedo, Snow melting, Snow water equivalent, Artificial thawing, Lasers, Telemetering equipment.

- 33-4217**  
Model experimentation with water seepage through polymer structured fills and foam plastic filters. [Model'nye opyty po izucheniiu fil'tratsii ostruktural'nykh polimerami drenaznykh zasypok i fil'trov iz penomaterialov]. Utkacheva, V.F., et al, Russia. *Ministerstvo vysshego i srednego spetsial'nogo obrazovaniia. Nauchnye doklady vysshego shkoly. Biologicheskii nauki*, 1979, 181(1), p.90-94. In Russian. 11 refs.
- 33-4218**  
Land reclamation, Swamps, Peat, Drains, Rock fills, Filters, Polymers.
- 33-4219**  
High altitude vegetation zoning of the eastern Pamirs. [K vysotnoi poiasnosti rastitel'nosti Vostochnogo Pamira]. Ukhacheva, V.N., Russia. *Ministerstvo vysshego i srednego spetsial'nogo obrazovaniia. Nauchnye doklady vysshego shkoly. Biologicheskii nauki*, 1978, 180(12), p.95-102. In Russian. 26 refs.
- 33-4220**  
Alpine land forms, Alpine soils, Alpine vegetation, Bibliographies.
- 33-4221**  
Calculating road pavements for frost resistance and drying. [Raschet dorozhnykh odezhd na morozoustoi-chivost' i osushenie]. Shchelopae, E.I., Russia. *Ministerstvo vysshego i srednego spetsial'nogo obrazovaniia. Izvestiia vysshikh uchebnykh zavedenii. Lesnoi zhurnal*, 1979, No.1, p.36-40. In Russian. 2 refs.
- 33-4222**  
Forestry, Pavements, Soil moisture migration, Frost penetration, Freezing rate, Frozen fines, Roads, Subgrades.
- 33-4223**  
Calculating heat loss of underground pipelines allowing for insulation. [K raschetu teplopoter' podzemnykh truboprovodov s uchedom izoliatsii]. Diachuk, R.P., et al, Russia. *Ministerstvo vysshego i srednego spetsial'nogo obrazovaniia. Izvestiia vysshikh uchebnykh zavedenii. Nef' i gaz*, 1978, No.9, p.65-69. In Russian. 10 refs.
- 33-4224**  
Furman, A.V.  
Pipeline insulation, Heat loss, Mathematical models, Underground pipelines.
- 33-4225**  
Attachment for microscopes used at low temperatures. [Prisposoblenie k svetovomu mikroskopu dlia raboty pri nizkikh temperaturakh]. Berkovich, M.A., et al, *Zavodskaya laboratoriia*, 1979, 45(1), p.40. In Russian.
- 33-4226**  
Tkachenko, G.T.  
Frost protection, Low temperature research, Deicing, Microscopes.
- 33-4227**  
Measuring unit for small tangential values of dielectric loss angles at low temperatures. [Achelka dlia izmereniia mal'kikh znachenii tangensa ugla dielektricheskikh poter' pri nizkikh temperaturakh]. Posadskii, A.A., et al, *Zavodskaya laboratoriia*, 1979, 45(1), p.41-43. In Russian.
- 33-4228**  
Kolodiev, B.N.  
Low temperature research, Test equipment, Measuring instruments.
- 33-4229**  
Sea ice ridging over the Alaskan continental shelf. Tucker, W.B., et al, *U.S. Army Cold Regions Research and Engineering Laboratory*, May 1979, CR 79-8, 24p., ADA-070 572, 24 refs.
- 33-4230**  
Weeks, W.F., Frank, M.D.  
Sea ice distribution, Pressure ridges, Ice deformation, Surface roughness, Profiles, Lasers, Mathematical models, Statistical analysis, Remote sensing, Forecasting.
- 33-4231**  
Sea ice ridging statistics obtained from a series of laser surface roughness profiles are examined. Each set of profiles consists of six 200-km-long flight tracks oriented approximately perpendicular to the coastline of the Chukchi and Beaufort Seas. The flights were made in February, April, August, and December 1976, and one additional profile was obtained north of Cross Island during March 1978. It was found that although there is a systematic variation in mean ridge height (h) with season (with the highest values occurring in late winter), there is no systematic spatial variation in h at a given time. The number of ridges/km is also high during the late winter, with the highest values occurring in the Barter and Cross Island profiles. In most profiles, the ice 20 to 60 km from the coast is more highly deformed than the ice either nearer the coast or farther seaward. The Wadhams model for the distribution of ridge heights gives better agreement with observed values in the higher ridge categories than does the Hubler model. Estimates of the spatial recurrence frequency of large pressure ridges are made by using the Wadhams model and also by using an extreme value approach. In the latter, the distribution of the largest ridges per 20 km of laser track was found to be essentially normal. Wadhams' distribution consistently predicts slightly larger ridge sails than does the extreme value approach.
- 33-4232**  
Point source bubbler systems to suppress ice. Ashton, G.D., *U.S. Army Cold Regions Research and Engineering Laboratory*, May 1979, CR 79-12, 12p., ADA-071 038, 8 refs.
- 33-4233**  
Mechanical ice prevention, Bubbles, Ice melting, Heat transfer, Water flow, Air temperature, Piles, Offshore structures, Computerized simulation.
- 33-4234**  
An analysis of a point source bubbler system used to induce local melting of an ice cover is presented. The analysis leads to a numerical simulation programmed in FORTRAN which may be used to predict the effectiveness of such systems. An example application is presented using a typical record of average daily air temperatures. The FORTRAN program for the point source simulation as well as a FORTRAN program for line source systems are included in the Appendix.
- 33-4235**  
Energy requirements for small flow wastewater treatment systems. Middlebrooks, E.J., et al, *U.S. Army Cold Regions Research and Engineering Laboratory*, Apr. 1979, SR 79-7, 82p., ADA-070 676, 16 refs.
- 33-4236**  
Middlebrooks, C.H.  
Waste disposal, Waste treatment, Ponds, Fluid infiltration, Seepage, Cost analysis.
- 33-4237**  
This report summarizes energy requirements for small wastewater treatment systems (0.05 - 5 million gallons per day) applicable to military installations. It compares various treatment combinations, and presents the energy requirements for the most viable alternatives in tabular form. It also presents energy requirements for various components of wastewater treatment systems in a format making it convenient to calculate the energy requirements for many combinations of the components. In addition, it summarizes briefly energy estimates made by others. The report compares typical combinations of unit operations and processes used to produce various quality effluents on the basis of energy consumption. It concludes that land application systems are the most energy-efficient wastewater treatment systems and that they are capable of producing an equivalent or higher quality effluent than any other treatment system.
- 33-4238**  
Seeking low ice adhesion. Sayward, J.M., *U.S. Army Cold Regions Research and Engineering Laboratory*, Apr. 1979, SR 79-11, 83p., ADA-071 040, 54 refs.
- 33-4239**  
Ice adhesion, Adhesive strength, Ice prevention, Ice solid interface, Wettability, Cohesion, Polymers, Deicers, Surface properties, Surface energy.
- 33-4240**  
Ice impairs operation of helicopters and other aircraft, antennae, power and communication lines, shipping and superstructures, canal locks, etc. Prevention or easier removal of icing requires reduction of its adhesion strength. Literature study shows that adhesion results from secondary (van der Waals) forces yet exceeds normal cohesive strengths. It depends on free surface energy, low contact angle, good contact and wetting, cleanliness, and texture. Modes of adhesion testing are briefly discussed. Poor adhesion occurs with low energy surfaces or contaminants, e.g. hydrocarbons, fluorocarbons, waxes, oils, etc., particularly when textured or porous. The resulting low contact angle, poor wetting and occlusion of air at the interface weaken the bond or provide stress loci which can initiate cracks and failure. Coefficient of expansion differences may help in release of ice. Further ideas appear among the 100 abstracts presented. A survey of over 300 manufacturers produced over 100 replies. Half of them offered some 100 products deemed worth testing. These are listed with addresses and contacts. Besides simple resins and other release agents, they include composites which combine low surface energy and stronger materials as micro-mixture, interpenetrating-network, "plastic-alloy," or filler-matrix systems. About 15 to 20 products appear of special interest. Samples of liquid coating or supplier-prepared panels of many are available for the testing phase to follow.
- 33-4241**  
Electromagnetic geophysical survey at an interior Alaska permafrost exposure. Sellmann, P.V., et al, *U.S. Army Cold Regions Research and Engineering Laboratory*, May 1979, SR 79-14, 7p., ADA-071 065, 5 refs.
- 33-4242**  
Delaney, A.J., Arcone, S.A.  
Permafrost physics, Permafrost structure, Ground ice, Ice wedges, Soil strength, Electromagnetic prospecting, Geophysical surveys, Seasonal freeze thaw. Road construction activity near Fairbanks, Alaska, in the late fall of 1977, revealed a large exposure of Fairbanks silt containing numerous massive ice features. These exposures are typical of those found in this region. Thaw, during the summer of 1978, caused the upper ice-rich sections to retreat several meters. Geophysical techniques were utilized over these exposures to determine if resistive anomalies of ice wedge dimension could be detected. Magnetic induction measurements at three intercoil spacings and low-frequency surface impedance measurements were made about 6 m from the edge of each exposure in April 1978 before thaw commenced. The results agree well with observations of the layering, but most individual anomalies are difficult to interpret because the lateral extent of the ice is unknown.
- 33-4243**  
Improved drainage and frost action criteria for New Jersey pavement design. Phase 2 (Data analysis). Berg, R.L., *U.S. Army Cold Regions Research and Engineering Laboratory*, May 1979, SR 79-15, 51p., ADA-071 041, 7 refs.
- 33-4244**  
Frost penetration, Subsurface drainage, Moisture content, Freezing indexes, Pavements.
- 33-4245**  
Before constructing actual highway pavements with open-graded drainage layers, frost penetration depths and moisture content profiles were measured beneath several pavements in New Jersey. Air and surface freezing indexes were measured at three locations during the 1975-1976 and 1976-1977 winters. All freezing indexes were considerably greater during the 1976-1977 winter. The modified Deggren equation was used to compute the maximum frost depth at 30 test sites. Measured maximum frost depths ranged from 20.5 in. to 52.0 in., while computed maximum values ranged from 14.0 in. to 61.0 in. The mean difference between observed and computed maximum frost penetration depths was 3.8 in. Maximum frost penetration depths were computed for hypothetical pavements with open-graded drainage at four of the test sites. It was concluded that open-graded drainage layers would not significantly change the frost penetration beneath highway pavements in New Jersey. It was recommended that test pavements be installed to verify the computations.
- 33-4246**  
Roof moisture survey—U.S. Military Academy. Korhonen, C., et al, *U.S. Army Cold Regions Research and Engineering Laboratory*, May 1979, SR 79-16, 8 refs.
- 33-4247**  
Tobiasson, W.  
Roofs, Walls, Leakage, Insulation, Moisture content, Infrared equipment, Measuring instruments.
- 33-4248**  
The roofs and upper story walls of buildings 745E, 752, and 756 at the U.S. Military Academy, West Point, New York, were surveyed with a hand-held infrared camera to locate sources of reported wall leaks. An electrical resistance probe was used to determine the relative level of moisture in wall components. Several 3-in.-diam core samples of each roof were obtained to verify suspected moisture conditions and to examine the roof membrane in cross section. Wet areas on each roof were outlined with white spray paint. Wall leaks are believed to be caused by wind-driven rain entering the parapet walls in locations where the decorative glaze-coat has spalled off. Recommendations for maintenance of these buildings are based on information derived from the infrared survey, electrical resistance readings, core samples and visual examinations.
- 33-4249**  
Evaluation of nitrification inhibitors in cold regions land treatment of wastewater: Part 1. Nitrification. Elgawhary, S.M., et al, *U.S. Army Cold Regions Research and Engineering Laboratory*, May 1979, SR 79-18, 25p., ADA-071 077, 21 refs.
- 33-4250**  
Iskandar, I.K., Blake, B.J.  
Waste treatment, Water treatment, Soil microbiology, Land reclamation, Arctic regions.
- 33-4251**  
A series of laboratory and field tests was conducted to investigate the possibility that nitrification could be useful as a nitrification inhibitor in land treatment of wastewater. Laboratory tests included soil incubation and soil column studies. Variables were soil type, temperature, nitrification concentration and method of application to the soil. Experimental designs included two soils, three temperatures (0, 10 and 20°C) and three levels of inhibitors in a complete factorial. Forage grasses were present in all treatments, and wastewater containing NH4-N was utilized. Weekly application of wastewater was 5 cm. Soil solution at depth and leachate at 160 cm were collected and analyzed weekly for NH4-N and NO3-N. That data indicate that nitrification was not effective in inhibiting nitrification when applied to the soil surface in soil columns simulating land treatment slow infiltration. The ineffectiveness of the compound under a mode of application where it is mixed and sprayed with wastewater is thought to be due to its volatility, sorption by organic matter, low water solubility and its immobility in soils. Other chemicals such as carbon disulfide and thiocarbonates, which have different characteristics than the nitrification, showed promising results. Research is under way to obtain conclusive data.
- 33-4252**  
Review of electrical resistivity of frozen ground and some electromagnetic methods for its measurement. Arcone, S.A., *Materials performance*, 1979, 18(5), MP 1215, p.32-37, 16 refs.
- 33-4253**  
Frozen ground physics, Electrical resistivity, Electromagnetic prospecting, Geophysical surveys, Radio waves, Soil moisture content, Soil temperature, Grain size, Airborne radar, Measuring instruments.
- 33-4254**  
Results of extensive studies of earth resistivities of low temperature soils are presented. Ground measurements of the electromagnetic field components of radio waves propagated at low frequencies from distant transmitters and of the inductive coupling between two loop antennas are described. Results of measurements by these methods are compared with each other and with actual findings from excavations and borings at permafrost sites. The measurements are shown to provide data on locations of lens ice, indicate zones of thawing, give indications which permit estimating resistivities of layers and permit construction of a map of Alaska identifying major resistivity zones. Airborne evaluation of remotely propagated waves permits con-

struction of resistivity contour maps. Reasons for variations in resistivity among various categories of frozen soils are discussed.

33-4232

Recommended environmental code of good practice for gas pipeline development. *Canada. Environmental Protection Service. Report*, Jan. 1977, 1-EC-77-1, 56p., In English with French summary. 18 refs. Gas pipelines, Environmental protection, Arctic regions.

33-4233

Ice dissipation in eastern Lake Erie. Yu, P.M.-T., Buffalo, State University of New York, Sep. 1977, 157 leaves, M.S. thesis. 47 refs. Lake ice, Ice breakup, Ice mechanics, Ice melting, Ice conditions, Heat transfer, Ice air interface, Solar radiation, Ice cover thickness, Meteorological data, Mathematical models, Computer applications.

33-4234

Calculating heating rate of frozen rocks in the field of a traveling electromagnetic wave, allowing for temperature. [Raschet nagreva merzlykh porod v pole begushchei elektromagnitnoi volny s ucheto temperatury].

Misnik, I.U.M., et al, *Russia. Ministerstvo vysshego i srednego spetsial'nogo obrazovaniia. Izvestiia vysshikh uchebnykh zavedenii. Gornyi zhurnal*, 1979, No.2, p.6-11, In Russian. 10 refs.

Rikenglaz, L.E., Khominskii, V.A. Mining, Excavating equipment, Artificial thawing, Unfrozen water content, Electric heating, Frozen rock temperature, Permafrost heat transfer.

33-4235

Petroleum exploration and environmental protection in the Alaskan Arctic. Britton, M.E., *U.S. Geological Survey. Yearbook*, 1978, p.27-38.

Aircraft landing areas, Environmental protection, Tundra soils, Soil trafficability, Motor vehicles, Tundra vegetation, Ice roads, Roads, Arctic regions, United States—Alaska.

33-4236

Determining subsea permafrost characteristics with a cone penetrometer—Prudhoe Bay, Alaska. Blouin, S.E., et al, *Cold regions science and technology*, June 1979, 1(1), MP 1217, p.3-16, 10 refs. Chamberlain, E.J., Sellmann, P.V., Garfield, D.E. Submarine permafrost, Penetration tests, Permafrost distribution, Penetrometers, United States—Alaska—Prudhoe Bay.

33-4237

Relationships between January temperatures and the winter regime in Germany.

Bilello, M.A., et al, *Cold regions science and technology*, June 1979, 1(1), MP 1218, p.17-27, 12 refs. Appel, G.C.

Weather forecasting, Frost forecasting, Snow accumulation, Seasonal freeze thaw, Meteorological data, Meteorological charts.

33-4238

Application of the Andrade equation to creep data for ice and frozen soil.

Ting, J.M., et al, *Cold regions science and technology*, June 1979, 1(1), p.29-36, 10 refs. Martin, R.T.

Ice strength, Frozen ground mechanics, Strains, Creep.

33-4239

Water flow through heterogeneous snow. Colbeck, S.C., *Cold regions science and technology*, June 1979, 1(1), MP 1219, p.37-45, 19 refs.

Meltwater, Snow cover structure, Water flow, Snow stratigraphy, Capillarity, Surface waters.

An earlier gravity flow theory (Colbeck 1971) treated snow as a homogeneous and uniform medium. The theory is expanded here to include the effects of ice layers and flow channels. Two examples are constructed and compared with observed runoff. In this particular situation, the results suggest that most of the water moves down flow channels.

33-4240

Snowpack albedo and snow density. Bohren, C.F., et al, *Cold regions science and technology*, June 1979, 1(1), p.47-50, 9 refs.

Beschta, R.L.

Snow surface, Snow density, Snow compaction, Albedo.

33-4241

Freezing and thawing tests of liquid deicing chemicals on selected pavement materials.

Minsk, L.D., *Cold regions science and technology*, June 1979, 1(1), MP 1220, p.51-58, 8 refs.

Concrete pavements, Deicing, Antifreezes, Tests. The extent of deterioration of portland cement concrete and several types of asphalt concrete subjected to organic deicing

chemicals was determined over 60 freezing-thawing cycles. Proprietary solutions containing urea, ethylene glycol, and formamide affected the surface of old air-entrained concrete only slightly (rating of 1 on a scale of 0 to 5 of increasing degradation). Asphaltic concrete specimens were not significantly affected. Abrasion tests were made on air-entrained concrete specimens exposed to ethylene glycol solution during freezing and thawing; material loss was very low, nearly the same as with a distilled water control.

33-4242

On icebergs and their uses. A report to the Australian Academy of Science.

Schwerdtfeger, P., *Cold regions science and technology*, June 1979, 1(1), p.59-79, 38 refs.

Water supply, Water reserves, Icebergs, Transportation, Sea water, Water temperature, Ice melting, Antarctica.

Various properties of icebergs are reviewed in the light of water requirements, both existing and potential, in sub-tropical lands. Most of the specific economic and environmental information provided is based on Australian examples. Some aspects of iceberg dynamics and thermodynamics are discussed and the concept of icebergs being valuable sources (or rather sinks) of energy in addition to their being reservoirs of fresh water is put forward.

33-4243

First International Symposium on Ground Freezing.

Diekmann, N., *Cold regions science and technology*, June 1979, 1(1), p.81-82.

Meetings, Soil freezing, Soil moisture migration, Phase transformations, Artificial freezing, Frozen ground mechanics.

33-4244

Seismic surface wave observations in West Antarctica.

Dewart, G., *Ohio. State University, Columbus. Institute of Polar Studies. Report*, 1978, No.70, 21p., 14 refs.

Ice sheets, Anisotropy, Seismic velocity, Seismic surveys, Antarctica—West Antarctica.

Explosion-produced seismic surface waves recorded along the Byrd Station Strain Network in West Antarctica were investigated. Amplitudes were much greater for Rayleigh waves than for Love waves. Higher modes of both wave types were registered. Group velocity dispersion analysis revealed significant lateral inhomogeneity in near-surface structure of the ice sheet throughout the study area. Velocity anisotropy was indicated at one site. (Auth.)

33-4245

Dynamics of large ice masses.

Koerner, R.M., *Geoscience Canada*, June 1979, 6(2), p.97-98.

Meetings, Ice sheets, Ice shelves, Sea ice, Glacier mass balance, Ice mechanics, Spacecraft, Surveys.

A report on the August 1978 meeting of the International Glaciology Society in Ottawa is presented. Brief critical remarks are made of each session; much valuable work was devoted to the West Antarctic ice sheet. The proceedings will be published as one issue of the *Journal of glaciology*.

33-4246

Some features of the turbulent transfer on the bare ice field near the Yamato Mountains, East Antarctica.

Kobayashi, S., *Tokyo. National Institute of Polar Research. Memoirs*, Mar. 1979, Special issue No.12, p.9-18, 15 refs.

Glacier ablation, Turbulent flow, Wind factors, Ice air interface, Antarctica—Shirase Glacier, Antarctica—Yamato Mountains.

Measurements were made of profiles of wind speed and air temperature on the bare ice surface on the lee of the Yamato Mountains from Dec. 1-7, 1973. The vertical profile of air temperature was found unstable in the daytime when the wind speed decreased, as the bare ice surface was heated by solar radiation. Consequently, a mean eddy heat flux transported from the surface was 50 ly/day. As for an energy budget, estimated latent heat flux was about 150 ly/day, which indicates the evaporation of 0.25 cm/day in the summer. The observations of wind turbulence by the use of sonic anemometer showed a strong turbulence generated by nunataks. This strong turbulence contributes to the surface ablation of bare ice in the summer. (Auth.)

33-4247

Dynamical features of the Meteorite Ice Field, Antarctica.

Naruse, R., *Tokyo. National Institute of Polar Research. Memoirs*, Mar. 1979, Special issue No.12, p.19-24, 14 refs.

Glacier ablation, Glacier flow, Glacier heat balance, Antarctica—Yamato Mountains.

Results of the glaciological work done in 1969 and 1973-1974 near the Yamato Mountains showed that the dynamic features of the southern Meteorite Ice Field (bare ice) were quite different from those of the ice sheet in the Shirase drainage, East Antarctica. In the ice field ice flowed toward the Yamato Mountains with the small horizontal velocity of less than 2 m/year; the vertical movement of ice indicated the emergence velocity of 5 cm/year on the average, and the ablation rate amounted to 5 cm/year in water equivalent. Whether the concentration of meteorites within a limit is possible, in

terms of a mass budget study in the present drainage system, is also discussed. The result revealed that, if a number of meteorites had once fallen uniformly over the hinterland of the drainages of the Shirase Glacier and of the Meteorite Ice Field, more than 95% of the meteorites were drained off through the coast of the ice sheet, and only a few percent of them were conveyed to and exposed on the bare ice field around the Yamato Mountains. (Auth.)

33-4248

Temperature profile in the bare ice area near the Yamato Mountains, Antarctica.

Nishio, F., et al, *Tokyo. National Institute of Polar Research. Memoirs*, Mar. 1979, Special issue No.12, p.25-37, 22 refs.

Mac, S.

Glacier ablation, Ice temperature, Ablation, Ice sheets, Antarctica—Yamato Mountains.

The temperature profile of the ice sheet in the bare ice area (Meteorite Ice Field) near the Yamato Mountains (72S, 36E) was calculated on the basis of the heat conduction theory under steady state conditions. The effect of geothermal heat flux, vertical velocity of ice mass and ice thickness on temperature profile was examined. Analysis of the profile in past stages of ice sheet fluctuation showed that before the Fukushima ice stage (about 10,000 years B.P.) upward velocity and ablation rate were approx zero, or the downward motion of ice mass and accumulation might have occurred. This result is completely different from the present state (upward velocity 5 cm/year and ablation rate 5 cm/year), which suggests that most of the Yamato meteorites collected in 1969-1975 were exposed on the surface of the area after the Fukushima stage. (Auth.)

33-4249

Antarctic Journal of the United States, Vol.14, No.2. U.S. National Science Foundation, Washington, D.C., Mar. 1979, 11p.

Ice shelves, Drilling, Thermal drills.

This issue contains articles on the new Siple Station, drilling through the Ross Ice Shelf, airborne research, the 1978 U.S. antarctic population, NSF funds awards for Oct. 1 to Dec. 31, 1978, a monthly climate summary, and special news announcements. The new Siple Station will house eight men during the coming austral winter and is expected to function as a year-round U.S. research platform until the late 1980's before needing replacement. Three holes were melted through the Ross Ice Shelf at Site J-9 during the final drilling season, using the Browning hot water drill. The operations and observations are described. Ice core obtained at the site by Soviet drillers, using thermal drills, is also described. The 1978 U.S. antarctic population varied from 112 to 1,064. The numbers and trends are plotted.

33-4250

Antarctic Journal of the United States, Vol.14, No.2. U.S. National Science Foundation, Washington, D.C., June 1979, 23p.

Glacier ice, Ice sheets, Ice shelves, Glacier flow.

This issue contains regulations to implement the Antarctic Conservation Act of 1978, a report of geologic and glaciological investigations out of a major field camp on Darwin Glacier, an article on the recovery of 309 meteorites from the antarctic ice sheet in the Allan Hills and Darwin Glacier areas last season, NSF funds awards for Jan. 1 to Mar. 31, 1979, the monthly climate summary, and other special announcements. The regulations establish a permit system for various activities in Antarctica and designate certain mammals and birds and certain geographic areas as requiring special protection, as well as sites of special scientific interest. The regulations are effective as of July 1, 1979. The Darwin Glacier studies focused on sites along and between the Darwin and Byrd Glaciers, which flow from East Antarctica to the Ross Ice Shelf, in an attempt to chart the geologic history of the region and to describe the current glaciological interactions between the ice streams and the Ross Ice Shelf.

33-4251

Introduction of new techniques of controlling construction processes under northern conditions.

[Vnedrenie novoi tekhniki kontrolya stroitel'nogo proizvodstva v usloviakh Severa].

Kudashov, E.A., et al, *Leningrad, Strolizdat*, 1978, 96p., In Russian. 36 refs.

Tenenbaum, P.S.

Construction materials, Construction equipment, Concrete structures, Standards, Concretes, Measuring instruments.

33-4252

Biologic activity of forest soils in Tuva. [Biologicheskaya aktivnost' lesnykh pochv Tuvy].

Nekrasova, V.D., et al, *Novosibirsk, Nauka*, 1978, 78p. In Russian. Refs. p.67-77.

Gukasian, A.B.

DLC QH161.N46  
Taiga soils, Plant ecology, Podsol, Soil profiles, Soil microbiology, Soil chemistry, Peat, Taiga vegetation.

- 33-4253  
Construction of artificial islands as Beaufort Sea drilling platforms.  
Garrat, D.H., et al, *Journal of Canadian petroleum technology*, Apr.-June 1978, 17(2), p.1-8, 9 refs.  
Kry, P.R.  
Artificial islands, Sands, Offshore drilling, Ice loads, Water waves, Sea ice, Wave propagation, Beaufort Sea.
- 33-4254  
Thermal regime modelled for drilling and producing in permafrost.  
Taylor, A.E., *Journal of Canadian petroleum technology*, Apr.-June 1979, 18(2), p.59-66, 26 refs.  
Phase transformations, Permafrost thermal properties, Boreholes, Thermal insulation, Drilling, Thermal regime, Mathematical models, Petroleum industry, Latent heat.
- 33-4255  
Arctic Pilot Project. *Shipbuilding and marine engineering international*, May 1979, 102(1228), p.179, 181, 183.  
Icebreakers, Tanker ships, Natural gas, Fuel transport, Marine transportation, Design.
- 33-4256  
Inerta 160—a bottom coating system for super heavy duty. *Shipbuilding and marine engineering international*, May 1979, 102(1228), p.184, 186-187.  
Icebreakers, Protective coatings, Polymers, Ice loads, Impact strength, Ice friction.
- 33-4257  
Hydrodynamic reduction gears for ice-breaking vessels. *Shipbuilding and marine engineering international*, May 1979, 102(1228), p.191-192.  
Icebreakers, Hydrodynamics.
- 33-4258  
ICEREM—an integrated computer programme by Mitsui for optimising the hull form of icebreaking ships. *Shipbuilding and marine engineering international*, May 1979, 102(1228), p.193.  
Icebreakers, Engineering, Ice resistivity, Computer applications.
- 33-4259  
Almirante Irizar—most powerful icebreaker in the South. *Shipbuilding and marine engineering international*, May 1979, 102(1228), p.186, 194, 197-198.  
Icebreakers, Ice navigation, Marine transportation, Bubbling.  
The antarctic icebreaker *Almirante Irizar*, ordered by the Argentine Government in 1975, was delivered on Dec. 15, 1978, by Wärtsilä's Helsinki Shipyard. The icebreaker is of a completely new type, designed for supplying the Argentinian research stations in Antarctica. It is capable of wintering in Antarctica with more than 200 persons on board. Different parts of the ship, including machinery, are briefly described. An air bubble system aids the icebreaker to navigate in ice conditions.
- 33-4260  
Behaviour of crude oil under fresh-water ice.  
Chen, E.C., et al, *Journal of Canadian petroleum technology*, Apr.-June 1976, 15(2), p.79-83, 12 refs.  
Keevil, B.E., Ramsier, R.O.  
Crude oil, Ice bottom surface, Drops (liquids), Coalescing, Ice water interface, Thermal regime, Laboratory techniques.
- 33-4261  
Environmental considerations in waste disposal from drilling in the shallow Beaufort Sea.  
Swanston, H.W., *Journal of Canadian petroleum technology*, July-Sep. 1977, 16(3), p.116-122, 10 refs.  
Waste disposal, Drilling fluids, Offshore drilling, Impurities, Environmental impact, Waste treatment, Petroleum industry, Beaufort Sea.
- 33-4262  
Thawing of permafrost beneath a buried pipe.  
Lunardini, V.J., *Journal of Canadian petroleum technology*, Oct.-Dec. 1977, 16(4), p.34-37, in English with French summary. 5 refs.  
Permafrost beneath structures, Pipelines, Ground thawing, Heat transfer, Heat loss, Permafrost thermal properties, Phase transformations, Soil freezing, Analysis (mathematics).
- 33-4263  
On vehicle mobility in snow-covered terrain. 1. Problem development and requirements for analysis.  
Yong, R.N., et al, *Journal of terramechanics*, Dec 1978, 15(4), p.223-235, 10 refs.  
Harrison, W.L.  
Snow cover effect, Trafficability, Snow cover structure, Heat transfer, Solar radiation, Vehicles, Interfaces, Snow density, Dynamic loads.
- 33-4264  
Scattering of polarized laser light by water droplet, mixed-phase and ice crystal clouds. Pt.1. Angular scattering patterns.  
Sassen, K., et al, *Journal of the atmospheric sciences*, May 1979, 36(5), p.838-851, 21 refs.  
Liou, K.-N.  
Ice crystal optics, Light scattering, Supercooled clouds, Ice crystal structure, Cloud droplets, Polarization (waves), Lasers, Laboratory techniques.
- 33-4265  
Scattering of polarized laser light by water droplet, mixed-phase and ice crystal clouds. Pt.2. Angular depolarizing and multi-scattering behavior.  
Sassen, K., et al, *Journal of the atmospheric sciences*, May 1979, 36(5), p.852-861, 12 refs.  
Liou, K.-N.  
Ice crystal optics, Artificial ice crystals, Ice crystal structure, Light scattering, Polarization (waves), Supercooled clouds, Lasers, Laboratory techniques.
- 33-4266  
Onset and early growth of snow crystals by accretion of droplets.  
Reinking, R.F., *Journal of the atmospheric sciences*, May 1979, 36(5), p.870-871, 25 refs.  
Snow crystal growth, Ice accretion, Cloud droplets, Hoarfrost, Ice crystal size, Cloud physics.
- 33-4267  
Further studies of large, water-insoluble particles within halitones.  
Rosinski, J., et al, *Journal of the atmospheric sciences*, May 1979, 36(5), p.882-891, 12 refs.  
Knight, C.A., Nagamoto, C.T., Morgan, G.M., Knight, N.C.  
Halitones, Particle size distribution, Solubility, X-ray analysis, Ice crystal nuclei.
- 33-4268  
Ice caused trans-Alaska oil leaks. *Engineering news-record*, July 19, 1979, 263(3), p.20.  
Pipelines, Leakage, Cold weather operation, Ice lenses, Hot oil lines, United States—Alaska.
- 33-4269  
GCOS future looks bright with improved mining methods, rising oil prices.  
Watson, L.M., *Canadian mining journal*, June 1979, 100(6), p.30-31, 34, 37-38.  
Mining, Cold weather operation, Engineering geology, Frozen sand, Blasting, Drilling, Cost analysis.
- 33-4270  
Investigation of the vacuum-oxygen system within the wide temperature range.  
Paryczak, T., et al, *Journal of colloid and interface science*, June 15, 1979, 70(2), p.320-327, 23 refs.  
Gebauer, D., Kozakiewicz, A.  
Oxygen, Metals, Interfaces, Chemical reactions, Temperature effects, Temperature gradients, Corrosion, Dispersions, Pressure.
- 33-4271  
Magneto-optics cryostat with balanced thermal dilatations.  
Escorne, M., et al, *Journal of physics E: Scientific instruments*, July 1979, 12(7), p.644-647, 4 refs.  
Mauger, A.  
Magnetometers, Cryogenics, Thermal expansion, Equipment.
- 33-4272  
Laminar and turbulent boundary layers adjacent to melting vertical ice walls in salt water.  
Josberger, E.G., *U.S. Office of Naval Research. Scientific report*, May 1979, No.16, 185p., 41 refs.  
Ice melting, Laminar flow, Turbulent boundary layer, Ice water interface, Salt water, Water temperature, Salinity, Icebergs, Analysis (mathematics), Computer applications.
- 33-4273  
Offshore drilling in Lancaster Sound: possible environmental hazards.  
Milne, A.R., et al, Sidney, B.C., Institute of Ocean Sciences, Feb. 1978, 95p., Refs. passim.  
Smiley, B.D.  
Offshore drilling, Submarine permafrost, Drift, Ocean currents, Environmental impact, Icebergs, Petroleum industry, Ice seeping, Marine biology, Oil spills, Canada—Northwest Territories—Lancaster Sound.
- 33-4274  
Icequakes around Syowa Station, Antarctica.  
Kaminuma, K., et al, *Antarctic record*, Mar. 1979, No.65, p.135-148, in Japanese with English summary. 13 refs.  
Haneda, T.  
Icequakes, Ice sheets, Seismology, Antarctica—Showa Station.  
Three types of icequakes were observed by the tripartite seismological network at Showa Station during the period from Feb. 1976 to Jan. 1977. The types are: (1) shocks with a sharp initial phase (named Type I), (2) shocks with a small or unidentified amplitude of initial phase (named Type II), and (3) swarms. More than 80,000 shocks of Type I and about 80 of Type II occurred through the year. A large number of shocks of Type I occurred in the austral winter season, whereas the number of Type II shocks was larger in summer than in winter. No correlations are identified between the icequake occurrence and the sea level change, and between that and the sea temperature change. The features of icequakes suggest that the shocks of Type II are caused by fractures in the ice near the shelf edge of the ice sheet, giving rise to the calving of icebergs and so on. Swarms are estimated to be caused by the temperature changes. (Auth.)
- 33-4275  
Analysis of Arctic sea ice fluctuations, 1953-77.  
Walsh, J.E., et al, *Journal of physical oceanography*, May 1979, 9(3), p.580-591, 26 refs.  
Johnson, C.M.  
Sea ice distribution, Ice conditions.
- 33-4276  
Frequency of avalanche release in Niigata Prefecture.  
Ikarashi, T., *Japan. National Research Center for Disaster Prevention. Report*, Mar. 1979, No.21, p.89-102, in Japanese with English summary. 9 refs.  
Avalanche formation, Avalanche deposits, Roads, Safety, Meteorological factors.
- 33-4277  
Avalanche caused by an earthquake.  
Higashiura, M., et al, *Japan. National Research Center for Disaster Prevention. Report*, Mar. 1979, No.21, p.103-112, in Japanese with English summary. 7 refs.  
Nakamura, T., Nakamura, H., Abe, O.  
Avalanche formation, Snow depth, Earthquakes, Snow density, Shear stress, Loads (forces), Mountains.
- 33-4278  
Winter life under the Arctic ice pack. *Science news*, July 7, 1979, 116(1), p.5-6.  
Marine biology, Environmental impact, Offshore drilling, Pack ice, Cold weather survival, Subglacial observations.
- 33-4279  
International Symposium on Ground Freezing, Volume 2.  
Jessberger, H.L., ed, Bochum, Germany, Ruhr University, 1978, 155p. + append., Refs. passim. For individual papers see 33-4280 through 33-4287. Also included are discussion and comments on papers from Vol.1 (32-3465 through 32-3496).  
Soil freezing, Artificial freezing, Frozen ground mechanics, Frozen ground thermodynamics, Frozen ground strength, Excavation, Earthwork, Soil stabilization, Freeze thaw cycles, Meetings.
- 33-4280  
Effects of temperature and pressure on frost heaving.  
Penner, E., et al, International Symposium on Ground Freezing, 1st, Bochum, Mar. 8-10, 1978, Vol.2. Edited by H.L. Jessberger, Bochum, Ruhr University, 1978, p.65-72, 3 refs.  
Walton, T.  
Frost heave, Temperature effects, Soil pressure, Frost action, Frost penetration, Soil freezing, Clay soils, Ice lenses.
- 33-4281  
Strain rate effect on the compressive strength of frozen sand.  
Baker, T.H.W., International Symposium on Ground Freezing, 1st, Bochum, Mar. 8-10, 1978, Vol.2. Edited by H.L. Jessberger, Bochum, Ruhr University, 1978, p.73-79, 13 refs.  
Artificial freezing, Frozen sand, Strain tests, Compressive strength, Moisture content.
- 33-4282  
Creep behaviour of frozen soils in uniaxial compression tests.  
Eckardt, H., International Symposium on Ground Freezing, 1st, Bochum, Mar. 8-10, 1978, Vol.2. Edited by H.L. Jessberger, Bochum, Ruhr University, 1978, p.81-93, 6 refs.  
Frozen ground mechanics, Creep properties, Rheology, Compressive properties, Static loads, Temperature effects, Stresses.

33-4283

Thermal and rheological computations for artificially frozen ground construction.

Sanger, F.J., et al, MP 1216, International Symposium on Ground Freezing, 1st, Bochum, Mar. 8-10, 1978, Vol.2. Edited by H.L. Jessberger, Bochum, Ruhr University, 1978, p.95-117, 32 refs.

Sayles, F.H.  
Soil freezing, Thermal properties, Artificial freezing, Frozen ground mechanics, Frozen ground thermodynamics, Creep properties, Rheology, Construction, Analysis (mathematics), Frost heave.

33-4284

Soil freezing method for large tunnel constructions. Wind, H., International Symposium on Ground Freezing, 1st, Bochum, Mar. 8-10, 1978, Vol.2. Edited by H.L. Jessberger, Bochum, Ruhr University, 1978, p.119-126.

Artificial freezing, Soil freezing, Frozen ground mechanics, Tunneling (excavation), Drilling, Construction.

33-4285

Construction of a sewer in artificially frozen ground. Bösch, H.-J., International Symposium on Ground Freezing, 1st, Bochum, Mar. 8-10, 1978, Vol.2. Edited by H.L. Jessberger, Bochum, Ruhr University, 1978, p.127-131.

Artificial freezing, Tunneling (excavation), Soil freezing, Subsurface structures, Pipe laying, Sewage, Construction, Sanitary engineering, Drilling.

33-4286

Subway construction in Stuttgart under protection of a frozen soil roof.

Jonuscheit, J.P., International Symposium on Ground Freezing, 1st, Bochum, Mar. 8-10, 1978, Vol.2. Edited by H.L. Jessberger, Bochum, Ruhr University, 1978, p.133-135.

Artificial freezing, Tunneling (excavation), Soil freezing, Frozen ground mechanics, Subsurface structures, Settlement (structural), Construction.

33-4287

Ground freezing for support of open excavations. Braun, B., et al, International Symposium on Ground Freezing, 1st, Bochum, Mar. 8-10, 1978, Vol.2. Edited by H.L. Jessberger, Bochum, Ruhr University, 1978, p.137-155, 27 refs.

Shuster, J.A., Burnham, E.W.  
Artificial freezing, Soil freezing, Excavation, Subsurface structures, Frozen ground mechanics, Pipe laying, Cost analysis.

33-4288

Ninth meeting of the Coordinating Council of the International Antarctic Glaciological Project. (Deviatoe soveshchanie koordinatsionnogo sojeta mezhdunarodnogo antarkticheskogo gliatsiologicheskogo sojeta (MAGP)).

Kotliakov, V.K., *Akademii nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovaniy. Khronika obsuzhdeniya*, 1978, No.34, p.5-8, In Russian.

Meetings, Ice sheets, Ice cover thickness, Radar echoes, Ice composition, Impurities, Ice structure.

The meeting was held at Chamonix, France, on May 13-16, 1978. Reports were presented by delegates of France, Great Britain, the USA, Australia, the USSR and Japan. Main topics discussed included radar echo sounding of the Antarctic ice cover, ice core drilling and thermal drills, geophysical surveying techniques on land, snow surveys and glaciological studies. Recommendations are offered concerning technical improvement of measuring instruments, research trends in their design, modernization of reconnaissance aircraft, and data processing and interpretation.

33-4289

Studies of the Greenland ice sheet in the Geophysical Isotope Laboratory of Copenhagen University. (Izuchenie grenlandskogo lednikovogo pokrova v geofizicheskoi izotopnoi laboratorii Kopengagenskogo universiteta).

Bazhev, A.B., et al, *Akademii nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovaniy. Khronika obsuzhdeniya*, 1978, No.34, p.8-13, In Russian.

Gordienko, F.G.  
Glacier ice, Ice sampling, Snow physics, Snow composition, Isotope analysis, Spectrometers, Ice sheets, Laboratory techniques, Test equipment.

33-4290

Cold Regions Research and Engineering Laboratory in the USA. (Laboratoriia po izucheniiu i osvoeniiu kholodnykh raionov v SSHA).

Frolov, A.D., *Akademii nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovaniy. Khronika obsuzhdeniya*, 1978, No.34, p.14-16, In Russian.

Ice physics, Snow physics, Permafrost physics, Permafrost hydrology, Research projects, Cold weather construction, Ice roads, Snow roads, Geophysical surveys, Infrared reconnaissance, Environmental protection, U.S. Army CRREL.

33-4291

Work of Soviet glaciologists in the USA and Antarctica for the Ross Ice Shelf Project in 1977/78. (Rabota sovetskikh gliatsiologov v SSHA i Antarktide po proektu issledovaniia shel'ovogo lednika Rossa v 1977/78 g.).

Zotikov, I.A., et al, *Akademii nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovaniy. Khronika obsuzhdeniya*, 1978, No.34, p.16-20, In Russian.

Zagorodnov, V.S.  
Ice shelves, Ice drills, Thermal drills, Sea ice, Ice formation, Ice melting, Ice bottom surface, Acoustic measuring instruments, Bottom sediment, Drill core analysis, Marine biology, Antarctica—Ross Ice Shelf.

Activities of Soviet glaciologists working for the Ross Ice Shelf Project included the studies of thermal regime and water movement beneath the ice, the processes of ice accretion and melting at the bottom surface monitored by a special acoustic device, thermal drilling of large diameter (60 cm) holes through the ice shelf, core drilling and sampling bottom sediments, and biological studies at the ocean bottom. In the USA, the scientists have visited organizations associated with antarctic research: the National Science Foundation in Washington, D.C., the U.S. Army Cold Regions Research and Engineering Laboratory in Hanover, New Hampshire, some state universities and the U.S. National Oceanic and Atmospheric Administration in Colorado.

33-4292

Regimes of West Caucasus glaciers depicted on maps of the World Atlas of Snow and Ice Resources. (Rezhim lednikov Zapadnogo Kavkaza na kartakh atlasa snezhno-ledovykh resursov mira).

Zverkova, N.M., et al, *Akademii nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovaniy. Khronika obsuzhdeniya*, 1978, No.34, p.21-34, In Russian with English summary. 32 refs.

Krenke, A.N., Tareeva, A.M.  
Glaciation, Mountain glaciers, Maps, Snow cover distribution, Snow accumulation, Slope processes.

33-4293

Generalization of mountain glacier contours depicted on small scale maps. (Generalizatsiia izobrazheniia konturov gornogo oledeneniia na melkomasshtabnykh kartakh).

Kravtsova, V.I., et al, *Akademii nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovaniy. Khronika obsuzhdeniya*, 1978, No.34, p.34-41, In Russian with English summary. 4 refs.

Loseva, V.G.  
Mountain glaciers, Mapping, Aerial reconnaissance, Spaceborne photography.

33-4294

Generalization principles followed in the World Atlas of Snow and Ice Resources in conformance with the adopted series of scales. (Nekotorye printsipy generalizatsii na kartakh atlasa snezhno-ledovykh resursov mira v sootvetstvii s priinyatym masshtabnym riadom).

Timofeeva, N.A., *Akademii nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovaniy. Khronika obsuzhdeniya*, 1978, No.34, p.41-46, In Russian with English summary. 7 refs.

Mapping, Glaciation, Snow cover distribution.

33-4295

Problems and contents of small scale snow avalanche maps. (O zadachakh i soderzhanii melkomasshtabnykh lavinnykh kart).

Glazovskaia, T.G., et al, *Akademii nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovaniy. Khronika obsuzhdeniya*, 1978, No.34, p.46-50, In Russian with English summary. 6 refs.

Miagkov, S.M.  
Snow surveys, Mapping, Avalanche forecasting.

33-4296

Methods of compiling avalanche danger maps of foreign territories in the World Atlas of Snow and Ice Resources. (Vozmozhnaia metodika sostavleniia kart lavinnoi opasnosti v atlase snezhno-ledovykh resursov mira na zarubezhnye territorii).

Glazovskaia, T.G., et al, *Akademii nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovaniy. Khronika obsuzhdeniya*, 1978, No.34, p.50-57, In Russian with English summary. 1 ref.

Miagkov, S.M., Okolov, V.F.  
Avalanches, Mapping, Snow cover distribution, Snow depth, Snow density, Air temperature, Avalanche forecasting, Charts.

33-4297

Avalanche map of the Altai-Sayan Mountains. (Karta lavin Altai-Saianskoi gornoj strany).

Kravtsova, V.I., et al, *Akademii nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovaniy. Khronika obsuzhdeniya*, 1978, No.34, p.58-64, In Russian with English summary. 5 refs.

Kuz'mina, I.S., Reviakin, V.S.  
Mountains, Snow cover distribution, Snow surveys, Mapping, Avalanche forecasting, Charts.

33-4298

Calculating accumulation fields at the alimentantion-boundary elevation of Caucasus glaciers. (Raschet polia akumulatsii na vysote granitsy pitaniia lednikov Kavkaza).

Tareeva, A.M., *Akademii nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovaniy. Khronika obsuzhdeniya*, 1978, No.34, p.64-68, In Russian with English summary. 9 refs.

Glaciers, Alimentation, Snow accumulation, Snow melting, Mass balance.

33-4299

Separation of water in subisothermal glaciers. (Vydelenie vody v subizotermicheskikh lednikakh).

Krass, M.S., *Akademii nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovaniy. Khronika obsuzhdeniya*, 1978, No.34, p.69-75, In Russian with English summary. 4 refs.

Glacier ice, Ice melting, Unfrozen water content, Heat transfer, Analysis (mathematics).

33-4300

Interactions and densities of glacier-snow field systems. (Vzaimodelstvie v sistemakh lednikov i snezhnikov i mera ikh kompaktnosti).

Mazo, V.L., *Akademii nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovaniy. Khronika obsuzhdeniya*, 1978, No.34, p.75-79, In Russian with English summary.

Glaciers, Firn fields, Distribution, Heat transfer, Moisture transfer.

33-4301

Snow cover equilibrium on mountain slopes. (O ravnovesii snezhnogo pokrova na sklonakh gor).

Bozhinski, A.N., et al, *Akademii nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovaniy. Khronika obsuzhdeniya*, 1978, No.34, p.101-107, In Russian with English summary. 8 refs.

Grigorian, S.S.  
Mountains, Slope processes, Snow cover stability, Avalanches, Slope orientation.

33-4302

Determining solar radiation penetration into snow for studying the formation of insolation avalanches in the Khibiny Mountains. (Opredelenie pronikaushchego v sneg solnechnoi radiatsii s tsel'iu izucheniia uslovii obrazovaniia insoliatsionnykh lavin v Khibinskikh gorakh).

Okolov, V.F., *Akademii nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovaniy. Khronika obsuzhdeniya*, 1978, No.34, p.107-112, In Russian with English summary. 2 refs.

Solar radiation, Snow depth, Avalanche formation.

33-4303

Possible changes in ice conditions in the Arctic Basin and in heat exchange with the atmosphere due to variations in interoceanic ice and water transfer. (Vozmozhnye izmeneniia ledovitosti i teploobmena s atmosferoi Arkticheskogo basseina pri izmeneniiakh mezhokeanicheskogo obmena vodami i pdom).

Falko, L.I., *Akademii nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovaniy. Khronika obsuzhdeniya*, 1978, No.34, p.112-116, In Russian with English summary. 9 refs.

Arctic Ocean, Water transport, Ice conditions, Air water interactions, Heat transfer.

- 33-4304**  
Monitoring glacial phenomena in the central Caucasus. (K probleme monitoringa gliatsial'nykh iavlenii na primere Tsentral'nogo Kavkaza). Tishchenko, A.P., et al, *Akademiia nauk SSSR. Institut geografi. Materialy gliatsiologicheskikh issledovani. Khronika obsuzhdeniia*, 1978, No.34, p.116-119, In Russian with English summary. 3 refs. Troshkina, E.S., Ushakova, L.A.  
Spaceborne photography, Snow cover distribution, Alpine land forms, Glaciation, USSR—Caucasus.
- 33-4305**  
Snow accumulation under different winter conditions in the mountain taiga landscapes of southern Sikhote Alin. (Osobennosti snegonakopleniia v raznye tipy zim v gorno-taiznykh landshtakh Iuzhnogo Sikhote-Alinai). Maliugin, I.U.F., *Akademiia nauk SSSR. Institut geografi. Materialy gliatsiologicheskikh issledovani. Khronika obsuzhdeniia*, 1978, No.34, p.119-123, In Russian with English summary. 14 refs.  
Taiga vegetation, Forest canopy, Mountains, Snow cover distribution, Snow accumulation, Snow surveys.
- 33-4306**  
Developing a scheme for glaciological regionalization of the Earth. (Opyt razrabotki skhemy gliatsiologicheskogo raiionirovaniia Zemli). Kruchinin, I.U.A., *Akademiia nauk SSSR. Institut geografi. Materialy gliatsiologicheskikh issledovani. Khronika obsuzhdeniia*, 1978, No.34, p.134-142, In Russian with English summary. 32 refs.  
Glaciation, Mapping, Glaciers, Permafrost, Nivation, Landscape types, Maps.
- 33-4307**  
Natural systems of nalds and mountain glaciers. (O prirodnykh sistemakh naledi i gornykh lednikov). Koreisha, M.M., et al, *Akademiia nauk SSSR. Institut geografi. Materialy gliatsiologicheskikh issledovani. Khronika obsuzhdeniia*, 1978, No.34, p.142-146, In Russian with English summary. 7 refs. Romanovskii, N.N.  
Mountain glaciers, Glacial hydrology, Periglacial processes, Nalds, Ice accretion, Recrystallization.
- 33-4308**  
Dynamic classification and mathematical models of glaciers. (Dinamicheskaia klassifikatsiia i matematicheskie modeli lednikov). Grigorii, S.S., et al, *Akademiia nauk SSSR. Institut geografi. Materialy gliatsiologicheskikh issledovani. Khronika obsuzhdeniia*, 1978, No.34, p.146-152, In Russian with English summary. 18 refs. Krass, M.S., Shumskii, P.A.  
Glaciers, Mathematical models, Glacier movement, Glacier ice, Ice structure, Ice strength, Ice deformation.
- 33-4309**  
Quasistationary characteristics of glacier dynamics according to surface observations. (Kvazistatsionarnaia kharakteristika dinamiki lednikov po nabludeniiam na poverkhnosti). Shuinskii, P.A., et al, *Akademiia nauk SSSR. Institut geografi. Materialy gliatsiologicheskikh issledovani. Khronika obsuzhdeniia*, 1978, No.34, p.152-163, In Russian with English summary. 7 refs. Krass, M.S., Mikhalev, V.I., Cherkasov, P.A.  
Glacier movement, Glacier surfaces, Alimentation, Glacier ablation, Mass balance, Ice deformation, Strains, Analysis (mathematics), Antarctica.  
Quasistationary dynamics of the Obruchev glacier (Polar Ural Mountains) and the marginal part of the Antarctic Ice Sheet is analyzed. The stress-strain state of ice, its rotation rate and velocity are calculated from surface observations. Formulas derived are recommended for estimating three-dimensional dynamics of glaciers and their bottom conditions.
- 33-4310**  
Shifting of snow and ice belts in mountains due to gravity factors. (O smeshchenii poisa snega i l'da v gorakh pod vlianiem gravitatsionnogo faktora). Tronov, M.V., *Akademiia nauk SSSR. Institut geografi. Materialy gliatsiologicheskikh issledovani. Khronika obsuzhdeniia*, 1978, No.34, p.163-167, In Russian with English summary. 11 refs.  
Mountains, Snow line, Slope orientation, Snow cover distribution, Mountain glaciers, Glacier oscillation.
- 33-4311**  
Using the elevation of glacier alimentation boundaries in hydrometeorological calculations. (Ispol'zovanie vysoty granitsy pitania na lednikakh v gidrometeorologicheskikh raschetakh). Krenke, A.N., et al, *Akademiia nauk SSSR. Institut geografi. Materialy gliatsiologicheskikh issledovani. Khronika obsuzhdeniia*, 1978, No.34, p.167-178, In Russian with English summary. 44 refs. Shantykova, L.N.  
Mountain glaciers, Glacier mass balance, Alimentation, Ablation, Glacier ice, Glacial hydrology.
- 33-4312**  
Time variations of meteorological parameters in different glaciation areas of the USSR. (Vremennaia izmenchivost' meteorologicheskikh parametrov v raznykh lednikovykh raiionakh SSSR). Voloshina, A.P., *Akademiia nauk SSSR. Institut geografi. Materialy gliatsiologicheskikh issledovani. Khronika obsuzhdeniia*, 1978, No.34, p.178-185, In Russian with English summary. 7 refs.  
Glacier ice, Alimentation, Glacier ablation, Air temperature, Solar radiation, Meteorological data, Meteorological factors.
- 33-4313**  
Influence of underlying surfaces on alimentation and ablation of glaciers. (Vliianie podstilaushchego poverkhnosti na pitanie i ablatiiu lednikov). Shumskii, P.A., et al, *Akademiia nauk SSSR. Institut geografi. Materialy gliatsiologicheskikh issledovani. Khronika obsuzhdeniia*, 1978, No.34, p.185-192, In Russian with English summary. 18 refs. Krass, M.S.  
Glacier oscillation, Glacier surfaces, Alimentation, Glacier ablation, Heat transfer.
- 33-4314**  
Glacier as an object of studying dynamics of atmospheric pollution. (Lednik kak ob'ekt izucheniia dinamiki zagriazneniia atmosfery). Anokhin, I.U.A., et al, *Akademiia nauk SSSR. Institut geografi. Materialy gliatsiologicheskikh issledovani. Khronika obsuzhdeniia*, 1978, No.34, p.192-197, In Russian with English summary. 9 refs.  
Glacier ice, Ice coring drills, Thermal drills, Ice cores, Drill core analysis, Air pollution.
- 33-4315**  
Glacial washout and air temperature at glacier surfaces. (Gliatsial'nyi smyv i temperatura vozdukh na poverkhnosti lednikov). Sheglova, O.P., et al, *Akademiia nauk SSSR. Institut geografi. Materialy gliatsiologicheskikh issledovani. Khronika obsuzhdeniia*, 1978, No.34, p.197-204, In Russian with English summary. 18 refs. Lebedeva, N.G.  
Glacier surfaces, Air temperature, Ablation, Glacial hydrology, Meltwater, Suspended sediments, Glacial rivers.
- 33-4316**  
Role of Antarctic shelf ice in frazil ice formation. (Rol' shelfovykh lednikov Antarkidy v obrazovanii vnutrivodnogo l'da). Chikovskii, S.S., *Akademiia nauk SSSR. Institut geografi. Materialy gliatsiologicheskikh issledovani. Khronika obsuzhdeniia*, 1978, No.34, p.205-210, In Russian with English summary. 15 refs.  
Sea ice, Ice formation, Frazil ice, Ice structure, Sea water freezing, Supercooled water, Antarctica.  
Frazil ice formation and its effect on ice conditions and polar seas hydrology are discussed. Its development begins with ice appearance on sea surface and continues through the whole winter season, the growth rate fluctuating and reaching its maximum during periods of most intensive tidal currents. Frazil ice thickness was measured up to 4 m beneath fast ice and not exceeding 0.5 m at the ice edge. It is believed that supercooled water areas formed near antarctic shores are responsible for frazil ice development.
- 33-4317**  
Calculating the depth of dynamic crevasses in naturally deforming ice covers. (Raschet glubiny dinamicheskikh treshchin v estestvenno deformiruiushchiesia lednikovom pokrove). Klokov, V.D., *Akademiia nauk SSSR. Institut geografi. Materialy gliatsiologicheskikh issledovani. Khronika obsuzhdeniia*, 1978, No.34, p.210-214, In Russian with English summary. 11 refs.  
Glacier ice, Ice surface, Ice cracks, Crevasses, Ice deformation, Glacial hydrology, Antarctica.  
Depths of crevasses at the periphery of the Antarctic Ice Sheet are calculated by solving the D.P. Nye ice flow equation for three glacier groups: ice cascades and outlet glaciers with frontal widths smaller and greater than 10 km. In all three groups crevasse depths increased with width amounting to 50-70, 55-85, and 60-100 m, respectively. Nomograms for crevasse depth
- determination are presented and applications of the results to glacial hydrology discussed.
- 33-4318**  
Kinetic theory of ice deformation. (Kineticheskaia teoriia deformirovaniia l'da). Vialov, S.S., *Akademiia nauk SSSR. Institut geografi. Materialy gliatsiologicheskikh issledovani. Khronika obsuzhdeniia*, 1978, No.34, p.214-226, In Russian with English summary. 10 refs.  
Ice deformation, Flow rate, Ice structure, Ice temperature, Strains.
- 33-4319**  
Automated data processing used in compiling the avalanche inventory of the USSR. (Avtomatizatsiia obrabotki dannykh pri sostavlenii kadastra lavin SSSR). Grakovich, V.F., et al, *Akademiia nauk SSSR. Institut geografi. Materialy gliatsiologicheskikh issledovani. Khronika obsuzhdeniia*, 1978, No.34, p.227-235, In Russian with English summary. 4 refs. Kanaev, L.A.  
Snow surveys, Avalanche forecasting, Computer applications, Data transmission, Data processing.
- 33-4320**  
Methods of estimating and large-scale mapping of avalanche areas. (Metodika otsenki i krupnomasshtabnoe kartografirovaniie lavinnol opasnosti territorii). Zolotarev, E.A., et al, *Akademiia nauk SSSR. Institut geografi. Materialy gliatsiologicheskikh issledovani. Khronika obsuzhdeniia*, 1978, No.34, p.235-241, In Russian with English summary. 29 refs. Akif'eva, K.V., Urumbaev, N.A.  
Snow surveys, Mapping, Snow cover distribution, Avalanche forecasting, Avalanche formation, Aerial photography.
- 33-4321**  
Physico-chemical methods of glacier stratification. (Fiziko-khimicheskie metody stratiatsirovaniia lednikov). Punning, I.A.-M.K., *Akademiia nauk SSSR. Institut geografi. Materialy gliatsiologicheskikh issledovani. Khronika obsuzhdeniia*, 1978, No.34, p.241-245, In Russian with English summary. 13 refs.  
Glacier ice, Stratigraphy, Paleoclimatology, Firn stratification.
- 33-4322**  
Methods of studying ice deformation in the Obruchev glacier tunnel. (Sposoby issledovaniia deformatsionnykh svoistv massiva l'da v tonnelle lednika Obrucheva). Tiulina, T.I.U., *Akademiia nauk SSSR. Institut geografi. Materialy gliatsiologicheskikh issledovani. Khronika obsuzhdeniia*, 1978, No.34, p.245-254, In Russian with English summary. 9 refs.  
Glacier ice, Ice structure, Ice deformation, Ice creep, Stratification, Stresses, Ice strength.
- 33-4323**  
Mathematical dependencies used for calculating snow densities. (Zavisimosti dlia raschetnogo opredeleniia plotnosti snezhnogo pokrova). Rozenberg, L.S., *Akademiia nauk SSSR. Institut geografi. Materialy gliatsiologicheskikh issledovani. Khronika obsuzhdeniia*, 1978, No.34, p.254-259, In Russian with English summary. 10 refs.  
Snow density, Snow depth, Air temperature, Wind velocity, Snow compaction, Analysis (mathematics).
- 33-4324**  
Chemical composition of glaciers and processes of its formation. (Khimicheskii sostav lednikov i protsessy ego formirovaniia). Korkina, N.M., *Akademiia nauk SSSR. Institut geografi. Materialy gliatsiologicheskikh issledovani. Khronika obsuzhdeniia*, 1978, No.34, p.260-278, In Russian. 70 refs.  
Glacier ice, Ice composition, Alimentation, Snow composition, Water chemistry, Glaciers.
- 33-4325**  
Iceberg conewth: international law relating to antarctic iceberg exploitation. (Lundquist, T.R., *Natural resources journal*, Jan. 1977, 17(1), p.1-41, 207 refs. DLC K14.A868  
Water supply, Ice (water storage), Iceberg towing.  
Recent studies have suggested the technological capability, economic feasibility, and environmental acceptability of transporting icebergs to arid regions in both the Southern and Northern Hemispheres. This article seeks to complement these iceberg exploitation proposals by examining the international legal interface with iceberg harvesting and transit. It is suggested that the unresolved legal status of Antarctica casts the largest cloud over entitlement certainty, since different antarctic regimes

would entail differences in the extent of ocean zones and conditions for harvesting icebergs. Other property rights uncertainty springs from the Antarctic Treaty, baseline demarcation, the breadth of the territorial sea (if one applies at all), the custom doctrine, the status of condominium and trusteeships, and problems with the Law of the Sea and the Negotiating Text.

33-4326

Water and ice balance of recent and ancient glaciation areas of the USSR. (Vodno-ledovyi balans raionov sovremennogo i drevnego oledeneniia SSSR). Khodakov, V.G., Moscow, Nauka, 1978, 194p., In Russian with English abstract and table of contents. 326 refs.

Mountain glaciers, Ice sheets, Glacier ice, Water balance, Alimentation, Ablation, Snow cover distribution, Snowstorms, Avalanches, Snowdrifts, Glacial hydrology, Charts.

33-4327

Ice cover effect on the distribution of velocities in a stream produced by a hydraulic actuator. (Vlianie ledianogo pokrova na raspredelenie skorostei v potoke, sozdannom gidroukoritelem). Soboleva, M.I., Gidrotekhnicheskoe stroitel'stvo i sooruzheniia (Hydraulic construction and structures), Leningrad, 1975, p.101-113, In Russian. 3 refs. DLC TC155.G47

Subglacial drainage, Mathematical models, Stream flow, Ice friction, Flow rate, Analysis (mathematics).

33-4328

Calculating heat transfer at the ocean-air interface. (Raschet potoka tepla na granitse razdela okean-atmosferai). Kalatskii, V.I., et al, Leningrad. Gidrometeorologicheskii nauchno-issledovatel'skii tsentr. Trudy, 1978, Vol.194, p.10-17, In Russian. 12 refs. Nesterov, E.S. Surface temperature, Air water interactions, Oceans, Heat transfer.

33-4329

Mathematical model of wind driven ice in the Caspian Sea. (Chislennaiia model' vetrovogo drel'a i'da v Kaspiskom more). Ovsienko, S.N., Leningrad. Gidrometeorologicheskii nauchno-issledovatel'skii tsentr. Trudy, 1978, Vol.194, p.53-58, In Russian. 5 refs. Sea ice, Drift, Mathematical models, Ice conditions, Ice forecasting.

33-4330

Calculating the nonmonotone variations of ice cover thickness in non-arctic seas. (Skhema rascheta nemonotonno izmeneniia tolshchiny i'da v nearkti-cheskikh moriakhi). Efroimson, V.O., Leningrad. Gidrometeorologicheskii nauchno-issledovatel'skii tsentr. Trudy, 1978, Vol.194, p.59-66, In Russian. 6 refs. Sea ice, Ice cover thickness, Ice formation, Ice growth, Ice melting, Ice air interface, Ice water interface, Heat transfer.

33-4331

Spatial distribution of the dates of first ice appearance on water bodies of the European USSR. (Isledovanie prostranstvennogo raspredeleniia srokov pervogo poiaivleniia i'da na vodnykh ob'ektakh evropeiskoi territorii SSSR). Sheremetevskaiia, O.I., Leningrad. Gidrometeorologicheskii nauchno-issledovatel'skii tsentr. Trudy, 1978, Vol.194, p.67-74, In Russian. 9 refs. Ice conditions, Ice forecasting, Sea ice, River ice, Lake ice.

33-4332

Forecasting ice conditions on the Sea of Azov. (Prognoz ledovykh uslovii na Azovskom more). Kruglov, A.A., Leningrad. Gidrometeorologicheskii nauchno-issledovatel'skii tsentr. Trudy, 1978, Vol.194, p.75-85, In Russian. 9 refs. Ice conditions, Ice forecasting, Meteorological data, Statistical analysis.

33-4333

Calculating the length of ice navigation routes in the Gulf of Finland. (Raschet protiazhenosti ledovykh trass v Finskoi zalivie). Nikolaev, S.G., Leningrad. Gidrometeorologicheskii nauchno-issledovatel'skii tsentr. Trudy, 1978, Vol.194, p.86-91, In Russian. 3 refs. Ice navigation, Icebreakers, Ice conditions.

33-4334

Meteorological loads on structures. (Meteorologicheskie nagruzki na sooruzheniia). Zavarina, M.V., ed, Leningrad. Glavnaia geofizicheskaiia observatoriia. Trudy, 1978, Vol.408, 104p., In Russian. For individual papers see 33-4335 through 33-4349. Refs. passim. Kopanov, I.D., ed. Buildings, Towers, Snow loads, Hoarfrost, Ice loads, Wind pressure, Power line icing, Icing detection, Mathematical models.

33-4335

Accuracy of climatic probability indices. (O tochnosti veroiatnostnykh klimaticheskikh pokazatelei). Zavarina, M.V., Leningrad. Glavnaia geofizicheskaiia observatoriia. Trudy, 1978, Vol.408, p.3-10, In Russian. 7 refs. Ice loads, Snow loads, Wind pressure, Wind velocity, Statistical data, Meteorological data, Accuracy.

33-4336

Prevailing types of ice-hoarfrost deposits in the European USSR. (Preobladaiushchii vid gololedno-izmorozevykh otlozhenii na ETS). Zavarina, M.V., et al, Leningrad. Glavnaia geofizicheskaiia observatoriia. Trudy, 1978, Vol.408, p.11-14, In Russian. 5 refs. Mytarev, M.N., Sokolova, S.N. Icing, Hoarfrost, Ice cover thickness, Ice structure, Ice loads, Meteorological data, Meteorological charts.

33-4337

Annual maxima of ice loads in the Asiatic USSR. (Godovye maksimumy gololednykh nagruzok na ATS). Mytarev, M.N., Leningrad. Glavnaia geofizicheskaiia observatoriia. Trudy, 1978, Vol.408, p.15-18, In Russian. 2 refs. Icing, Hoarfrost, Ice loads, Ice cover thickness, Ice structure, Meteorological data.

33-4338

Evaluating an indirect method of calculating ice loads on tall structures. (K otsenke kosvennogo metoda rascheta gololednykh nagruzok na vysotnye sooruzheniia). Bolkov, V.P., Leningrad. Glavnaia geofizicheskaiia observatoriia. Trudy, 1978, Vol.408, p.19-26, In Russian. 11 refs. Towers, Icing, Hoarfrost, Ice loads, Icing rate, Design.

33-4339

Improving indirect calculation of the plane surface icing rate. (K utocneniiu kosvennogo metoda rascheta intensivnosti obledeneniia ploskoi poverkhnosti). Glukhov, V.G., et al, Leningrad. Glavnaia geofizicheskaiia observatoriia. Trudy, 1978, Vol.408, p.27-37, In Russian. 11 refs. Zakharov, A.G. Icing, Glaze, Hoarfrost, Ice loads, Ice growth, Icing rate.

33-4340

Perfecting the icing intensity chart of Pamir-Alai according to power line breakdown data. (Utochnenie karty gololednogo raionirovaniia Pamiro-Alaia po svedeniiaim ob avariiakh vozdukhnykh liniit elektropredachi i sviazi). Popova, A.P., et al, Leningrad. Glavnaia geofizicheskaiia observatoriia. Trudy, 1978, Vol.408, p.38-43, In Russian. 4 refs. Pershin, I.I. Power line icing, Ice loads, Hoarfrost, Mapping, Meteorological charts.

33-4341

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33-4342

Distribution and density of ice-hoarfrost deposits on plane surfaces. (Osobennosti raspredeleniia i plotnosti gololedno-izmorozevykh otlozhenii na ploskoi poverkhnosti). Zakharov, A.G., Leningrad. Glavnaia geofizicheskaiia observatoriia. Trudy, 1978, Vol.408, p.49-54, In Russian. 2 refs. Icing, Hoarfrost, Ice loads, Buildings, Roofs, Walls.

33-4343

Duration of especially dangerous icing periods on Sakhalin Island. (Prodolzhitel'nost' osobo opasnykh obledeneniia na Sakhaline). Bergardt, R.P., Leningrad. Glavnaia geofizicheskaiia observatoriia. Trudy, 1978, Vol.408, p.55-57, In Russian. 5 refs. Ice forecasting, Power line icing, Ice loads, Meteorological data, USSR-Sakhalin Island.

33-4344

Wind loads on iced power lines in lowlands of the European USSR. (Raspredelenie vetrovykh nagruzok na provoda vozdukhnykh liniit pri golode na ravninnoi chasti evropeiskoi territorii SSSR). Golikova, T.N., Leningrad. Glavnaia geofizicheskaiia observatoriia. Trudy, 1978, Vol.408, p.58-61, In Russian. 5 refs. Power line icing, Wind pressure, Ice loads, Ice forecasting, Meteorological charts.

33-4345

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33-4346

Some wind characteristics used in determining loads on tall structures. (Nekotorye kharakteristiki vetra dlia opredeleniia nagruzok na vysokie sooruzheniia). Borisenko, M.M., Leningrad. Glavnaia geofizicheskaiia observatoriia. Trudy, 1978, Vol.408, p.70-79, In Russian. 18 refs. Buildings, Wind pressure, Wind velocity, Design.

33-4347

Snow loads on objects of the Apatit industrial complex named after S.M. Kirov. (O snegovykh nagruz-kakh v raione ob'ektov proizvodstvennogo ob'edineniia "Apatit" im. S.M. Kirova). Belen'kii, B.M., Leningrad. Glavnaia geofizicheskaiia observatoriia. Trudy, 1978, Vol.408, p.80-86, In Russian. 12 refs. Mining, Buildings, Snow loads, Design.

33-4348

Natural illumination intensity on vertical surfaces in the USSR. (Osveshchennost' vertikal'nykh poverkhnostei na territorii SSSR). Khalrullin, K.Sh., Leningrad. Glavnaia geofizicheskaiia observatoriia. Trudy, 1978, Vol.408, p.87-95, In Russian. 11 refs. Windows, Walls, Insolation, Design, Buildings.

33-4349

Allowing for moistening of vertical surfaces in Tashkent. (Uchet uvlazhneniia vertikal'nykh poverkhnostei v g. Tashkente). Aminov, E.Kh., Leningrad. Glavnaia geofizicheskaiia observatoriia. Trudy, 1978, Vol.408, p.96-103, In Russian. 7 refs. Walls, Precipitation (meteorology), Moisture content, Wind velocity, Buildings, Analysis (mathematics).

33-4350

Calculating the information content of the landscape indication and the geophysical electric profiling methods from data of engineering-geocryological surveys in northwestern Siberia. (Raschet informativnosti landshaftno-indikatsionnogo i geofizicheskogo metoda EP po materialam inzhenerno-geokriologicheskoi s'emki territorii severa Zapadnoi Sibiri). Goral'chuk, M.I., et al, Sovremennye metody izucheniia svoistv i sostoiianiia gornykh porod (Modern methods of studying the state and properties of rocks), Moscow, 1976, p.30-38, In Russian. 3 refs. Chekrygina, S.N., Iakimova, A.S. DLC TA706.S68 Geophysical surveys, Engineering geology, Geocryology, Electrical prospecting, Peat, Permafrost structure, Frozen rock temperature.

33-4351

Bridge on drilled situ-cast supports. (Most na buronabivnykh oporakh). Sokolov, O.L., et al, Transportnoe stroitel'stvo, June 1979, No.6, p.11, In Russian. Pakhomova, L.N. Bridges, Permafrost beneath structures, Piers, Foundations, Permafrost temperature, Permafrost control.

- 33-4352 Cooling devices for strengthening and control of perennially frozen bases. (Sokhranenie i ukreplenie merzlykh osnovanil okhlazhdaushchimi ustanovkami). Gapeev, S.I., *Transportnoe stroitel'stvo*, June 1979, No.6, p.20-22, In Russian. Permafrost bases, Permafrost control, Buildings, Foundations.
- 33-4353 Selecting the structure of nonburied fill foundations. (Vybór konstruktssii podsyipki dlia nezaglablennykh fundamentov). Tishin, V.G., *Transportnoe stroitel'stvo*, June 1979, No.6, p.49-51, In Russian. 3 refs. Buildings, Foundations, Rock fills, Permafrost beneath structures, Frost heave.
- 33-4354 Criteria for evaluating sectional thermoinsulative structures. (Kriterii otsenki polnosbornykh teploizolatsionnykh konstruktssii). Zvonarev, M.G., et al, *Energeticheskoe stroitel'stvo*, May 1979, No.5, p.16-18, In Russian. 5 refs. Popov, V.G., Chebotarev, V.D. Prefabrication, Pipeline insulation, Thermal insulation, Construction materials.
- 33-4355 Effective electric methods of pre-construction thawing of permafrost. (Ratsional'nye sposoby predpostrochnogo elektrootaitvaniia vechnomerzlykh gruntov). Maksimenko, E.S., *Energeticheskoe stroitel'stvo*, May 1979, No.5, p.28-29, In Russian. 2 refs. Cold weather construction, Earthwork, Ground thawing, Artificial thawing, Permafrost.
- 33-4356 Fundamentals of design and construction on macroporous sagging ground. (Osnovy proektirovaniia i stroitel'stva na prosadochnykh makroporistykh gruntakh). Abelev, I.U.M., et al, Moscow, Stroizdat, 1979, 271p., In Russian with English table of contents enclosed. 80 refs. Abelev, M.I.U. Clay soils, Loess, Soil moisture migration, Thixotropy, Buildings, Foundations, Settlement (structural), Soil stabilization, Piles, Cements.
- 33-4357 Effect of fluid flow on freezing and thawing of saturated porous media. Goldstein, M.E., et al, *Royal Society of London. Proceedings. Series A*, 1978, No.364, p.45-73, 7 refs. Reid, R.L. Freeze thaw tests, Porous materials, Permafrost heat transfer, Fluid flow, Seepage, Soil stabilization, Heat transfer, Saturation, Analysis (mathematics).
- 33-4358 Workshop on snow cover and sea ice data. World Data Center A for Glaciology, *Glaciological data*, May 1979, GD-5, 117p., Refs. passim. For individual papers see 33-4359 through 33-4370. Snow cover distribution, Sea ice distribution, Ice conditions, Ice forecasting, Remote sensing, Data processing, Mapping.
- 33-4359 Snow and ice data sets for climate and water resources studies with particular reference to North America. Jenne, R.L., et al, *Glaciological data*, May 1979, GD-5, p.7-23, Refs. p.18-21. Crane, R.G. Snow cover distribution, Sea ice distribution, Ice conditions, Snow hydrology, Meteorological data, Water reserves, Mapping, Models.
- 33-4360 Data sources and sea ice products of Fleet Weather Facility/Joint Ice Center, Svalbard. Godin, R.H., *Glaciological data*, May 1979, GD-5, p.29-35, 8 refs. Sea ice distribution, Ice forecasting, Remote sensing, Maps. Since 1973, the U.S. Navy Fleet Weather Facility, Svalbard, has produced global sea ice analyses for purposes ranging from guiding ships through ice infested waters to numerical heat budget model inputs. The weekly Antarctic Sea Ice Chart is produced almost exclusively from satellite information. Other data sources and analysis tools are mentioned.
- 33-4361 Mapping and archiving of Canadian sea ice data. Markham, W.E., *Glaciological data*, May 1979, GD-5, p.37-39, 8 refs. Sea ice distribution, Ice cover thickness, Ice conditions, Ice surveys, Mapping.
- 33-4362 DMSP near IR sensor for cloud/snow discrimination. Kimball, A.W., Jr., *Glaciological data*, May 1979, GD-5, p.43-47, 4 refs. Snow cover distribution, Remote sensing, Infrared radiation, Cloud cover, Measuring instruments, Design.
- 33-4363 United States environmental satellite data archives. Hoppe, E.R., *Glaciological data*, May 1979, GD-5, p.49-56, 5 refs. Ice conditions, Remote sensing, Data processing, Meteorological data, LANDSAT.
- 33-4364 Satellite-derived river basin snow-cover percentages: a new data base for hydrologists. Schneider, S.R., *Glaciological data*, May 1979, GD-5, p.57-60, 3 refs. Snow cover distribution, Snow hydrology, River basins, Remote sensing, Data processing, Mapping.
- 33-4365 LANDSAT-derived snow cover as a forecast tool in the Rio Grande basin in Colorado. Shafer, B.A., *Glaciological data*, May 1979, GD-5, p.61-69, 5 refs. LANDSAT, Remote sensing, Snow cover distribution, Snow hydrology, Flood forecasting, Aerial photographs, Snowmelt, Forecasting, Seasonal variations, Runoff, River basins.
- 33-4366 Archiving and mapping of Canadian snow cover data. Findlay, B.F., *Glaciological data*, May 1979, GD-5, p.71-87, 20 refs. Snow cover distribution, Snow accumulation, Snowfall, Data processing, Vegetation factors, Mapping, Canada.
- 33-4367 Accuracy of snow and ice monitoring. Kukla, G., *Glaciological data*, May 1979, GD-5, p.91-97, 8 refs. Snow cover distribution, Ice conditions, Snow depth, Heat balance, Albedo, Mapping, Accuracy.
- 33-4368 Arctic sea ice data set, 1901-1956. Kelly, P.M., *Glaciological data*, May 1979, GD-5, p.101-106, 25 refs. Sea ice distribution, Ice forecasting, Data processing, Meteorological data.
- 33-4369 Inadequacies in archived sea ice data. Dehn, W.S., *Glaciological data*, May 1979, GD-5, p.107-108. Sea ice distribution, Ice conditions, Data processing, Ice forecasting, Ice navigation, Offshore drilling.
- 33-4370 NASA mapping projects (summary). Zwally, H.J., *Glaciological data*, May 1979, GD-5, p.109-111, 2 refs. Sea ice distribution, Ice conditions, Meteorological data, Mapping, Remote sensing, Spacecraft. A mapped brightness temperature data set for the Southern Hemisphere is being converted into a set of sea ice concentration maps. The antarctic maps for sea ice concentration from 1973-76 will be completed during 1979. A preliminary analysis of the variation of the antarctic sea ice limits and open water within the pack for 1973, 1974 and 1975 is presented. Ice extent was less in 1975, but there also appears to have been less open water within the pack ice.
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- 33-4372 Beneath the ice. Thompson, T., *TRW systems and energy magazine*, Summer 1979, 3(2), p.1-3. Gas pipelines, Offshore structures, Equipment, Arctic regions.
- 33-4373 Parameter effects on dynamic properties of frozen soils—discussion. Chae, Y.S., *American Society of Civil Engineers. Geotechnical Engineering Division. Journal*, July 1979, 105(GT7), p.907-908, For the article by T.S. Vinsen being discussed, see 33-646. 1 ref. Frozen ground mechanics, Dynamic properties, Viscoelasticity.
- 33-4374 Modeling ice regime of Lake Erie. Wake, A., et al, *American Society of Civil Engineers. Hydraulics Division. Journal*, July 1979, 105(HY7), p.827-844, 30 refs. Rumer, R.R., Jr. Lake ice, Heat balance, Heat transfer, Water temperature, Ice cover thickness.
- 33-4375 Ice studies: visit to the Radio Physics Laboratory of the Arctic and Antarctic Research Institute in Leningrad. Bentley, C.R., *American Geophysical Union. Transactions*, Mar. 6, 1979, 60(10), p.151. Research projects, Radio echo soundings, Ice cover thickness. Summarized here in some detail are discussions of Russian research efforts regarding radio echo soundings of various ice masses in the Arctic and Antarctic. Discussions were held in June 1977.
- 33-4376 On the use of the electro-optical distance meter in geomorphological research. (Elektro-optisen etäisyysmittarin käytöstä geomorfologissessa tutkimuksessa). Seppälä, M., *Terra*, 1979, 91(1), p.21-25, In Finnish with English summary. 6 refs. Measuring instruments, Mass movements (geology), Lasers, Glacier movement.
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- 33-4378 Local temperature measurements over ice-water interface and convective flow patterns. Azouni, M.A., *Journal of crystal growth*, July 1979, 47(1), p.109-114, 13 refs. Ice water interface, Temperature measurements, Temperature variations, Convection.
- 33-4379 Norwegian Committee on Permafrost, activities in 1976-78. (NTNF's Utvalg for Permafrost. Virksomhet i årene 1976-78). Gregersen, O., *Frost i jord*, May 1979, No.20, p.3-8, In Norwegian with English summary. 11 refs. Permafrost beneath buildings, Cold weather construction, Organizations.
- 33-4380 General discussion on utilities delivery in permafrost regions. (En generell omtale av vann- og avløpssystemer i permafrostområder). Moen, T.L., *Frost i jord*, May 1979, No.20, p.9-16, In Norwegian with English summary. 11 refs. Permafrost beneath buildings, Utilities, Subsurface structures, Pipe laying, Heat loss, Water pipes, Freezing, Countermeasures, Thermal insulation, Hot water, Cost analysis.
- 33-4381 Influence of the heat extraction rate on the ice segregation rate of soils. Loch, J.P.G., *Frost i jord*, May 1979, No.20, p.19-30, 12 refs. Frost heave, Heat flux, Heat loss, Soil freezing, Soil temperature, Ice lenses, Soil moisture migration, Experimentation.
- 33-4382 Suggestions for an improved standard laboratory test for frost heave susceptibility of soils. Loch, J.P.G., *Frost i jord*, May 1979, No.20, p.33-38, 12 refs. Frost heave, Soil freezing, Heat flux, Heat loss, Experimentation.
- 33-4383 Calculated risk for exceeding design load during the service life of structures. (Risiko for lastoverskridelse i bygningers funksjonstid). Hierstedt, R.S., *Frost i jord*, May 1979, No.20, p.39-43, In Norwegian with English summary. 4 refs. Structures, Loads (forces), Climatic factors, Time factor, Analysis (mathematics), Design, Snow loads.

- 33-4384**  
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- 33-4385**  
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- 33-4388**  
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Kochetov, S.V., ed.  
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- 33-4389**  
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- 33-4390**  
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- 33-4393**  
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- 33-4394**  
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Zakharov, V.F.  
Fast ice, Polynyas, Air water interactions, Ice formation, Arctic Ocean.
- 33-4395**  
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Ice breakup, River crossings, Ice forecasting, Flood forecasting, Ice jams, Icebound rivers, Flood control, Permafrost hydrology, Subsurface drainage, Runoff, Baykal Amur railroad, Ice deterioration.
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- 33-4402**  
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Sewage disposal, Waste disposal, Ponds, Cold weather performance, Sewage treatment.

33-4409

Satellite ocean-related imagery applications program—final report. *Memorial University of Newfoundland. Centre for Cold Ocean Resources Engineering. C-CORE publication*, June 1979, No.79-6, 487p., Refs. p.317-320.  
Spaceborne photography, Aerial reconnaissance, Sea ice distribution, Icebergs, Ice conditions, Mapping, Data processing, Water temperature.

33-4410

Subsurface ice and heavily icy ground as bases for structures.  
Vialov, S.S., et al, *U.S. Army Foreign Science and Technology Center. Translation*, Apr. 1979, FSTC-HT-1295-78, 274p., ADB-038 016, For Russian original see 32-1655. 48 refs.  
Dokuchaev, V.V., Shelinkman, D.R.  
Ice physics, Ground ice, Permafrost bases, Ice strength, Ice creep, Foundations.

33-4411

Test report on engineering test instruction no. 71033-T002 airblast assisted snowplow.  
Andersen, J.L., *Canada. Land Engineering Test Establishment. Report*, Feb. 1975, No 11/75, 35 leaves  
Snow removal equipment, Blowers.

33-4412

Data record of current observations, Vol.16, Beaufort Sea, 1974 to 1976.  
Huggett, W.S., et al, Sidney, B.C., Institute of Ocean Sciences, Patricia Bay, 1977, 139p.  
Woodward, M.J., Douglas, A.N.  
Oceanography, Ocean currents, Measurement.

33-4413

Electrical ground impedance measurements in the United States between 200 and 415 kHz.  
Arcone, S.A., et al, *U.S. Federal Aviation Agency. Research and development report*, Dec. 1978, FAA-RD-78-103, MP 1221, 92p. ADA-068 088.  
Delaney, A.J.  
Radio waves, Electrical resistivity, Mapping.

"The objectives of the work described in this report were to use and evaluate new radio wave methods of measuring earth resistivity in the LF and VLF bands and to develop estimated effective ground resistivity maps in this same band for the United States, including Alaska. Both airborne and ground methods were investigated by using the wavelit and surface impedance techniques. It is concluded from the VLF study that over much of the central United States VLF airborne resistivity might well approximate LF ground resistivity. The ground methods discussion concerns the surface impedance method in the LF band. It is concluded from the LF studies that the present conductivity map is fairly accurate for BCB purposes but inapplicable to LF purposes.

33-4414

Effect of temperature on the strength of snow-ice.  
Haynes, F.D., *U.S. Army Cold Regions Research and Engineering Laboratory*, Dec 1978, CR 78-27, 25p. ADA-067 583.

Snow strength, Ice strength, Temperature effects, Tensile strength, Compressive strength.

Uniaxial compression and tension tests were conducted on polycrystalline snow-ice to determine the effect of temperature on its strength. Test temperatures ranged from -0.1°C to -54°C. Two machine speeds, 0.847 mm/s and 84.7 mm/s were used for the constant displacement rate tests. The compressive strength at -54°C was about one order of magnitude higher than at -0.1°C. The tensile strength at -18°C was about 20% higher than at -0.1°C. The initial tangent and 50% strength moduli are given for the compression tests, while the secant modulus to failure is given for the tension tests. The mode of fracture is discussed and the test results are compared with data from other investigations.

33-4415

Analysis of the midwinter temperature regime and snow occurrence in Germany.  
Bilello, M.A., et al, *U.S. Army Cold Regions Research and Engineering Laboratory*, Sep. 1978, CR 78-21, 56p. ADA-066 934.

Appel, G.C.

Air temperature, Snowfall, Meteorological data, Weather forecasting, Statistical analysis.

This study investigates the possibility of providing estimates of the time of occurrence and length of the freezing season for any location in East and West Germany by using the average January air temperature (AJAT) as an index. The results indicate that reliable values of the mean freezing index can be obtained from the AJAT relationships which are developed for Germany. This association is further verified using data from the northeastern part of the U.S. and the AJAT is then used to determine the average starting and ending dates (and hence the probable length) of the freezing season for stations in Germany. The AJAT and the average dates of snowfall occurrence for numerous locations in the U.S. and Germany are also correlated. Interrelationships between these parameters and the average number of days with snow on the ground for stations up to 3000 m in elevation in Germany are examined.

33-4416

Relationships between static and dynamic characteristics of deformability of frozen and thawed rock in rock samples and undisturbed rock masses.

Voronkov, O.K., et al, *U.S. Army Cold Regions Research and Engineering Laboratory*, Jan. 1979, TL 703, 15p., ADB-033 625L, 7 refs. For Russian original see 33-1717. Distribution limited to U.S. Government agencies only.

Nozdin, G.I., Mikhailovskii, G.V.

Frozen rocks, Foundations, Frozen ground settling.  
In conjunction with the exploitation of the natural resources of the Far North and permafrost regions, as well as the construction of large engineering projects on rock foundations under these conditions, the study of the relationship between static and dynamic characteristics of deformability has become an important and timely problem. The results given here permit a number of practical conclusions to be drawn which will be of value in locating and studying rock foundations in permafrost areas.

33-4417

Terrain sensitivity, Mackenzie Valley and northern Yukon. *Task Force on Northern Oil Development. Environmental-Social Committee. Report*, 1974, No.74-44, 2 maps, 10 refs. In French and English. No microfiche available.

Terrain analysis, Surface properties, Soil strength, Glacial deposits, Glacial till, Environmental impact, Canada—Mackenzie Valley, Canada—Yukon River.

33-4418

Report of Operation Deep Freeze 79, 1978-1979.  
U.S. Naval Support Force, Antarctica, San Francisco, Calif., July 9, 1979, var.p.  
Military operation, Cold weather operation, Logistics.

This report summarizes Deep Freeze 79 operations in support of the U.S. antarctic research program. Information is provided on air, ship, meteorological, photographic, crash/fire, Byrd surface camp, and terminal operations, public works, logistics, communications and electronics, medical and dental procedures, administration, and executive staff activities. Highlights and noteworthy aspects of the support season are listed chronologically.

33-4419

Global pollution: Is the Arctic haze actually industrial smog.

Kerr, R.A., *Science*, July 20, 1979, 205(4403), p.290-293.

Air pollution, Aerosols, Rain.

It is suggested that the pollution that produces acid rain, known to travel hundreds of kilometers from its source, may continue its travels into the pristine Arctic. It is noted that in contrast to the Arctic where air masses follow short, direct paths from pollution sources into low-lying arctic areas, the sources of pollution for the Antarctic, which is one of the cleanest places on earth, are farther away and the winds between them and the 3000-m-high interior follow long, rising spirals.

33-4420

Global surface albedo model.

Hummel, J.R., et al, *Journal of applied meteorology*, Mar. 1979, 18(3), p.239-253, 39 refs.

Reck, R.A.

Albedo, Pack ice, Land ice, Snow cover, Tundra regions.

A model has been used to determine the average surface albedo of the earth's surface in latitudinal bands for the four seasons of the year. In addition, global maps of surface albedo for elements 10 deg latitude by 10 deg longitude are provided. The model involves assigning one of 49 different types of surface to each of 77,040 areas for each of the four seasons. Each type of surface is assigned a different albedo for each season. The average surface albedo for a given latitudinal band is obtained by averaging the albedos for the areas in the desired latitudinal band. The average surface albedos are intended to be used for input data in our radiative-convective energy balance model of the earth's atmosphere in order to compute the atmospheric temperature profile. The average annual albedo values for 18 different latitudinal bands are compared with the predictions of three other studies. The values in this work tend to be slightly lower than the others from 30N-30S, and slightly higher from 90-50N and 50-90S. The annual global average albedo is calculated to be 15.40 as compared to 13.0 for the previous predictions. The arctic and antarctic regions are discussed.

33-4421

Environmental assessment of the Alaskan continental shelf, Vol.4. Biological studies. Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, Mar. 1979, 804p., Principal investigators' final reports. Numerous refs.  
Marine biology, Natural resources, Ecology, Fish, Populations.

33-4422

Environmental assessment of the Alaskan continental shelf, Vol.5. Biological studies. Boulder, Colorado, Outer Continental Shelf Environmental Assessment Program, Mar. 1979, 710p., Principal investigators' final reports. Numerous refs.  
Animals, Ecology, Environmental impact, Oil pollution, Marine biology, Metals, Sea water.

33-4423

Detection of Arctic water supplies with geophysical techniques.

Arcone, S.A., et al, *U.S. Army Cold Regions Research and Engineering Laboratory*, June 1979, CR 79-15, 30p., ADA-072 157, 38 refs.

Delaney, A.J., Sellmann, P.V.

Water supply, Detection, Ground water, Magnetic properties, Radio waves.

This report discusses the application of several modern geophysical techniques to groundwater exploration in areas of permafrost. These methods utilize the principles of magnetic induction and radiowave surface impedance in the 10- to 400 kHz band, the techniques of impulse and side-looking radar in the 50- to 10,000 MHz band, and also some optical techniques using imagery obtained from a satellite, all for detecting free water under an ice cover in shallow, almost completely frozen lake basins, and thaw zones within lake beds, stream channels, and in permafrost in general. The radar studies demonstrate the use of these techniques for determining depth of free water and ice cover thickness on lakes and rivers.

33-4424

Photoelastic instrumentation—principles and techniques.

Roberts, A., et al, *U.S. Army Cold Regions Research and Engineering Laboratory*, May 1979, SR 79-13, 153p., ADA-072 011, 83 refs.

Hawkes, I.

Measuring instruments, Optical properties, Stresses, Elastic properties, Indicating instruments, Photoelasticity.

This report contains a detailed review of the theory and design of photoelastic transducers for measuring loads, strains, stresses and pressures. The measurement of engineering parameters under the adverse conditions normally encountered in the mining and civil engineering industries presents great problems, particularly where such measurements are to be made over long periods of time. Photoelastic transducers have distinct advantages over competing equipment in this respect in that the parameters to be measured are revealed as light interference fringes, and the measuring gage itself often need consist of nothing more than simple steel and glass components. Examples of such gages are given in the report. The majority of the work reported here was carried out by the staff and students of the Postgraduate School of Mining, Sheffield University.

33-4425

Rapid detection of water sources in cold regions—a selected bibliography of potential techniques.

Smith, D.W., comp, *U.S. Army Cold Regions Research and Engineering Laboratory*, May 1979, SR 79-10, 75p. ADA-070 030.

Smith, G.A., comp, Brown, J.M., comp, Schraeder, R.L., comp, Kosikowski, L., comp.

Bibliographies, Ground water, Water supply, Detection, Electrical resistivity.

A review of current literature on existing techniques that could be utilized in the rapid location of water sources for field camp use in permafrost regions resulted in the selection of three non-ground contact methods of electrical resistivity and two radar methods as being the most effective techniques. The search included thousands of references; 77 of these were chosen to be included in the annotated bibliography. The interest level or pertinence of each entry to the study is indicated, and keywords are provided. The keyword index contains all keywords for all entries listed in alphabetical order.

33-4426

NaNO<sub>2</sub>-Na<sub>2</sub>SO<sub>4</sub> combined additive in cold concrete. People's Republic of China. Institute of Low Temperature Building Sciences, Heilongjiang, *U.S. Army Cold Regions Research and Engineering Laboratory*, May 1979, TL 717, 55p., ADA-071 504, Translated from unidentified source.

Concrete admixtures, Antifreezes, Concrete strength, Corrosion prevention, Winter concreting.

Experiments were conducted in which NaNO<sub>2</sub>, Na<sub>2</sub>SO<sub>4</sub> and N(C<sub>2</sub>H<sub>4</sub>OH)<sub>3</sub> were added to cold concrete to prevent freezing and promote strengthening. NaNO<sub>2</sub> was added in an amount equal to 13.3% of the water content of the concrete, and Na<sub>2</sub>SO<sub>4</sub> and N(C<sub>2</sub>H<sub>4</sub>OH)<sub>3</sub> in amounts equal to 3% and 0.03%, respectively, of the cement content. The concrete was kept from freezing at -10°C and the strength increased to over 60% of the design strength after 28 days and 80%-90% of the design strength after three months. This type of additive used at higher temperatures (+10 to +15°C) results in an early strengthening effect, good concrete density, resistance to infiltration of up to 28-30 kg/sq cm, strength in the later stages 5 to 10% greater than that of ordinary concrete, and physical properties superior to those of ordinary concrete. Because of the rust-preventing action of NaNO<sub>2</sub>, the cold concrete additives do not have any rusting or corroding effects on the steel

bars. The facts that cold concrete is convenient to work with, additives are obtained easily and costs are comparatively low make this an excellent method for winter construction.

33-4427

Oceanographic data report d'Iberville Fiord Ellesmere Island, N.W.T.

Frozen Sea Research Group, Pacific Marine Science report 77-23, Sidney, B.C., Environment Canada, Institute of Ocean Sciences, Patricia Bay, 1977, 101p., 15 refs.

Oceanographic surveys.

33-4428

Atmospheric physics. (Fizika atmosfery), Khrgian, A.Kh., Leningrad, Gidrometeoizdat, 1978, 2 vols., In Russian with English summary. 281 refs. 2nd edition. For first ed. see SIP 10003.

Atmospheric physics, Meteorology, Solar radiation, Clouds (meteorology), Precipitation (meteorology), Snow, Hail, Glaze, Sea ice, Aircraft icing, Permafrost.

33-4429

Flora and vegetation of Kuznetsky Alatau highlands. (Flora i rastitel'nost' vysokogor' Kuznetskogo Alatau),

Sedelnikov, V.P., Novosibirsk, Nauka, 1979, 168p., In Russian with English table of contents enclosed. Refs. p.162-167.

Alpine vegetation, Alpine tundra, Tundra vegetation, Swamps, Alpine land forms, Alpine soils.

33-4430

Underground mining technology for deep-seated placers in the northeastern USSR. (Tekhnologiya podzemnoi razrabotki glubokozalegavushchikh rossypel Severo-Vostoka SSSR),

Lubli, K.I., Novosibirsk, Nauka, 1978, 49p., In Russian with English table of contents enclosed.

Placer mining, Excavating equipment, Mine shafts, Supports, Frozen coal, Ground ice, Drilling, Blasting, Permafrost.

33-4431

Manual for highway engineers (Highway design and research). (Spravochnik inzhenera-dorozhnika (Izyskaniia i proektirovanie avtomobil'nykh dorog)), Andreev, O.V., ed, Moscow, Transport, 1977, 559p. (Pertinent p.344-506), In Russian with abridged English table of contents enclosed.

Roads, Roadbeds, Permafrost beneath roads, Frost heave, Embankments, Slope stability, Settlement (structural), Pavements, Culverts, Drainage, Bridges.

33-4432

Hydrochemistry of rivers in the Baykal Amur railroad area. (Gidrokimiia rek trassy BAM), Tarasov, M.N., et al, Leningrad, Gidrometeoizdat, 1978, 76p., In Russian with English table of contents enclosed.

Lapshina, T.P., Bashmakova, O.I. Cryogenic soils, Taiga soils, Taiga vegetation, Permafrost hydrology, Rivers, Ice composition, Water chemistry, Charts, Baykal Amur railroad.

33-4433

Structural geomorphology of West Siberia. (Strukturalnaia geomorfologiya Zapadnoi Sibiri), Ziat'kova, L.K., Novosibirsk, Nauka, 1979, 200p., In Russian with English table of contents enclosed. Refs. p.148-164.

Geomorphology, Cryogenic relief, Permafrost weathering, Cryogenic processes, Solifluction, Mountain glaciers, Glacial erosion, Spaceborne photography, Photointerpretation.

33-4434

Hydrography of Pamirs and Pamir-Alai (water resources). (Gidrografiia Pamira i Pamiro-Alaia (vodnye resursy)),

Kemmerikh, A.O., Moscow, Mysl', 1978, 246p., In Russian with English table of contents enclosed. Refs. p.255-263.

Glacial hydrology, Glacier ice, Alimentation, Glacier ablation, Glacial rivers, Snow cover distribution, Slope processes, Mudflows, Glaciology, USSR—Pamir-Alai Mountains.

33-4435

Small-scale testing of soils for frost action and water migration.

Sayward, J.M., U.S. Army Cold Regions Research and Engineering Laboratory, May 1979, SR 79-17, 17 p., ADA-071 989, 25 refs.

Soil tests, Frost action, Soil moisture migration, Frost heave, Ice needles.

A method is described by which frost action (soil heaving and needle ice) and the use of soil additives for its control can be studied. The apparatus and procedure are simple and convenient, requiring no extensive space or services and using only small quantities of materials. The procedure could be useful in developing a standard test for such purposes where small scale

and convenience are requisite. Also described are two simple, small-scale accessory tests that likewise relate to permeability of soils. These evaporation and wetting tests might also have similar use, particularly in the study of water migration-inhibiting additives.

33-4436

Determination of frost penetration by soil resistivity measurements.

Atkins, R.T., U.S. Army Cold Regions Research and Engineering Laboratory, July 1979, SR 79-22, 24p., ADA-071 990.

Measuring instruments, Frost penetration, Electrical resistivity, Frozen ground physics.

Two sensors that depend on changes in soil resistivity were tested. Tests were conducted under a parking area with an asphalt-concrete surface where salt was periodically applied as part of snow removal operations. For comparison, data were obtained from a resistivity probe, a thermocouple probe and a thermistor probe. Results indicated that measuring temperature to determine frost penetration can lead to large errors under some conditions, for instance when salt has been applied or when frost is coming out of the ground in spring. The resistivity probe performed reliably during the entire measurement program. It was concluded that resistivity probes have definite advantages which should be considered when future frost penetration measurement programs are designed.

33-4437

Penetration tests in subsea permafrost, Prudhoe Bay, Alaska.

Blouin, S.E., et al, U.S. Army Cold Regions Research and Engineering Laboratory, May 1979, CR 79-7, 45p., ADA-071 999, 9 refs.

Chamberlain, E.J., Sellmann, P.V., Garfield, D.E.

Submarine permafrost, Bottom sediment, Penetration tests, Penetrometers, Offshore drilling.

Sediments beneath the Beaufort Sea near Prudhoe Bay, Alaska, were probed at 27 sites using a static cone penetrometer to determine engineering properties and distribution of material types, including ice-bonded sediments. The probe provided both point and casing resistance data and thermal profiles. At five sites these data were correlated with information from adjacent drilled and sampled holes. These control data and the quality of the probe information permitted profiles of sediment type and occurrence of ice-bonded material to be developed along three lines that included various geological features and depositional environments. Material properties were quite variable in the upper 14 m of sediments probed. In general, softer, finer-grained sediments occurred in the upper layers, while penetration refusal was met in stiff gravels 10 to 12 m below the seabed. Seabed temperatures during the study were all below 0C. However, because of uncertainties in freezing point values caused by brines, evaluation of the penetration resistance data was required to identify the occurrence of ice-bonded sediments. The coupling of thermal and penetration resistance data revealed that seasonally ice-bonded sediments occurred where the sea ice froze back to or near the seabed. Deeper, perennially frozen sediments also appeared to be present at several probe sites. The penetration data obtained can be used to aid in the design of shallow and deep foundations in both ice-bonded and unfrozen subsea sediments.

33-4438

Sedimentological analysis of the western terminus region of the Matanuska Glacier, Alaska.

Lawson, D.E., U.S. Army Cold Regions Research and Engineering Laboratory, May 1979, CR 79-9, 112p., ADA-072 000, Refs. p.109-112.

Glacial deposits, Glacial geology, Sediment transport, Glacial till.

Sedimentation at the terminus of the Matanuska Glacier has been found to be primarily subaerial in a 100- to 300-m wide, ice-cored zone paralleling the edge of the active ice. Certain physical and chemical characteristics of the ice and debris of the superglacial, englacial and basal zones of the glacier indicate the debris of the basal zone, the primary source of sediment, is entrained during freeze-on of meltwater to the glacier sole. Till formation results from the melting of buried ice of the basal zone. Melt-out till inherits the texture and particle orientations of basal ice debris; other properties are not as well preserved. Most deposits result from sedimentation of till and debris by sediment gravity flows, meltwater sheet and till flow, slump, spall, and ice ablation. Depositional processes are interrelated in the process of backwasting of ice-cored slopes. Sediment flows are the primary process of sedimentation. Their physical characteristics, multiple mechanisms of flow and deposition, and characteristics of their deposits vary with the water content of the flow mass. Deposits of each process are distinguished from one another by detailed analysis of their internal organization, geometry and dimensions, and the presence of other internal and related external features. Genetic facies are defined by these characteristics.

33-4439

Subsea cryolithozone of the Arctic Ocean.

Are, F.E., U.S. Army Cold Regions Research and Engineering Laboratory, May 1978, TL 686, 26p., ADA-069 856, For Russian original see 32-322. Refs. p.16-26.

Frozen rocks, Subsurface investigations, Shores, Sea level, Submarine permafrost.

The cryolithic zone is the designation for a zone of the Earth's crust having a sub-freezing point temperature, the frozen rocks are rocks which contain ice, the cold (frost) rocks are rocks whose temperature is below zero but do not contain ice.

It is reliably known that a cryolithic zone is extensively developed below the bottom of the Arctic Ocean and its fringe seas. However, the geocryological study of the sea bottom is extremely deficient. Reports about the distribution, properties and developmental principles of rocks of the sea bottom cryolithic zone have already long been necessary to support navigation through the northern maritime routes and for the construction of ports. Their requirement has sharply increased in connection with the initiated recovery of natural resources of the arctic shelf. The enormous practical significance, poorly studied nature of and poor access to the subsea cryolithic zone render its investigation one of the most interesting and pressing problems of modern cold research.

33-4440

Distribution of snow depth in the USSR.

Kopanev, I.D., et al, U.S. Army Cold Regions Research and Engineering Laboratory, May 1978, TL 687, 15p., ADA-069 855, For Russian original see 32-616. 16 refs.

Lipovskaia, V.I.

Snow surveys, Snow depth, Seasonal variations.

33-4441

Algolization of wastewater with subsequent use for irrigation. U.S. Army Cold Regions Research and Engineering Laboratory, May 1978, TL 689, 4p., ADA-069 854, Translation of Algolizatsia stochnykh vod posleduiushchim ispol'zovaniem na oroshenie,

Kupavna, All Union Scientific Research Institute for Utilization of Wastewater in Agriculture, 1975, 7p.

Waste treatment, Water treatment, Irrigation, Algae.

The need for the treatment (decontamination) of residential and urban wastewater for irrigation purposes is dictated by the need to protect the environment from pollution and insure the rational utilization of water resources. This report discusses the purification of wastewater prior to use in irrigation.

33-4442

Collection of articles on wastewater and its uses for irrigation in the Soviet Union. U.S. Army Cold Regions Research and Engineering Laboratory, July 1978, TL 692, 59p., ADA-069 857, Translation of Russian articles from unidentified sources.

Waste treatment, Water treatment, Irrigation, Health.

This collection deals with various aspects of wastewater irrigation (wwi), including: irrigating with untreated and treated wastewaters; the usefulness of wwi; how much of waste substances should be removed prior to irrigating feed crops; effect of wwi on grass crop yield; effectiveness of fertilizers during wwi; construction of treatment ponds; effect of wwi on boggy land; and effect on animals (rabbits) of forage from lands using wwi.

33-4443

Proceedings, Vol.2.

Conference on Applied Techniques for Cold Environments, Anchorage, Alaska, May 17-19, 1978, New York, American Society of Civil Engineers, 1979, p.631-1167, Refs. passim. For selected papers see 33-4444 through 33-4465. For Vol.1 see 32-3596 through 32-3643.

Cold weather construction, Permafrost beneath structures, Pipelines, Pile foundations, Ice conditions, Frozen ground mechanics, Permafrost hydrology, Meetings.

33-4444

Model studies of ocean floor scouring by icebergs.

Chari, T.R., et al, Conference on Applied Techniques for Cold Environments, Anchorage, Alaska, May 17-19, 1978. Proceedings, Vol.2, New York, American Society of Civil Engineers, 1979, p.828-839, 14 refs. Muthukrishnaiah, K.

Icebergs, Bottom sediment, Offshore structures, Ice scouring, Damage, Ice loads, Soil strength, Impact strength, Mathematical models.

33-4445

Slope stability studies in a cold environment.

Donovan, N.C., et al, Conference on Applied Techniques for Cold Environments, Anchorage, Alaska, May 17-19, 1978. Proceedings, Vol.2, New York, American Society of Civil Engineers, 1979, p.840-851, 6 refs.

Krzewinski, T.G.

Slope stability, Soil strength, Landslide control, Solifluction, Permafrost preservation, Rock glaciers, Hot oil lines, Environmental impact.

33-4446

Design and construction of river training structures.

Veldman, W.M., et al, Conference on Applied Techniques for Cold Environments, Anchorage, Alaska, May 17-19, 1978. Proceedings, Vol.2, New York, American Society of Civil Engineers, 1979, p.852-863, 3 refs.

Yaremkov, E.K.

Channel stabilization, Bank protection (waterways), River basins, Water erosion, Floods, Runoff, Ice melting, River flow, Design.

- 33-4447**  
Seepage-induced erosion along buried pipelines. Vita, C.L., et al, Conference on Applied Techniques for Cold Environments, Anchorage, Alaska, May 17-19, 1978. Proceedings, Vol.2, New York, American Society of Civil Engineers, 1979, p.864-874, 3 refs. Rooney, J.W.  
Pipelines, Subsurface structures, Seepage, Flow rate, Frost penetration, Soil erosion, Seasonal freeze thaw, Frozen ground mechanics.
- 33-4448**  
Port of Anchorage marine terminal design. Perdicchizzi, P., et al, Conference on Applied Techniques for Cold Environments, Anchorage, Alaska, May 17-19, 1978. Proceedings, Vol.2, New York, American Society of Civil Engineers, 1979, p.875-886, 15 refs. Yasuda, T.  
Ports, Ice loads, Wharves, Pile foundations, Tidal currents, Ice conditions, Sea ice distribution, Floating ice, Ice navigation, Docks, United States—Alaska—Anchorage.
- 33-4449**  
Cold region considerations relative to development of the Susitna hydroelectric project. Yould, E.P., et al, Conference on Applied Techniques for Cold Environments, Anchorage, Alaska, May 17-19, 1978. Proceedings, Vol.2, New York, American Society of Civil Engineers, 1979, p.887-895. Osterkamp, T.  
Dams, Electric power plants, Ice conditions, Environmental protection, Glacial till, Frazil ice, Ice loads, Arctic climate, Cost analysis, Subarctic climate.
- 33-4450**  
Corps of Engineers experience with concrete construction in Alaska. Anderson, F.A., Conference on Applied Techniques for Cold Environments, Anchorage, Alaska, May 17-19, 1978. Proceedings, Vol.2, New York, American Society of Civil Engineers, 1979, p.903-914, 2 refs. Cold weather construction, Concrete structures, Concrete strength, Thermal factors, Winter concreting, Air entrainment, Precast concrete.
- 33-4451**  
Advances in Arctic construction methods and equipment. Eliason, K.E., Conference on Applied Techniques for Cold Environments, Anchorage, Alaska, May 17-19, 1978. Proceedings, Vol.2, New York, American Society of Civil Engineers, 1979, p.915-921.  
Permafrost beneath structures, Pipe laying, Suspended pipelines, River crossings, Pipeline supports, Construction equipment, Permafrost hydrology, Drilling, Hot oil lines, Water supply, Cost analysis, Design.
- 33-4452**  
Grouting silt and sand at low temperatures. Johnson, R., MP 1078, Conference on Applied Techniques for Cold Environments, Anchorage, Alaska, May 17-19, 1978. Proceedings, Vol.2, New York, American Society of Civil Engineers, 1979, p.937-950, 2 refs.  
Grouting, Viscosity, Soil stabilization, Frozen ground mechanics, Sands, Stress strain diagrams, Compressive strength, Temperature effects, Cold weather operation, Resins, Tests.
- 33-4453**  
Predicting feasibility of cold weather earthwork. Roberts, W.S., et al, Conference on Applied Techniques for Cold Environments, Anchorage, Alaska, May 17-19, 1978. Proceedings, Vol.2, New York, American Society of Civil Engineers, 1979, p.960-972, 35 refs. Lovell, C.W., West, T.R.  
Earthwork, Cold weather construction, Permafrost structure, Soil texture, Forecasting, Seasonal variations, Climatic factors, Meteorological data, Maps, Cost analysis.
- 33-4454**  
Permafrost foundation designs. Long, E.L., Conference on Applied Techniques for Cold Environments, Anchorage, Alaska, May 17-19, 1978. Proceedings, Vol.2, New York, American Society of Civil Engineers, 1979, p.973-987, 16 refs.  
Permafrost beneath structures, Pile foundations, Soil creep, Frozen ground mechanics, Shear strength, Soil stabilization, Active layer, Foundations, Design.
- 33-4455**  
Exterior walls of the North (a design consideration). Odsather, R.L., Conference on Applied Techniques for Cold Environments, Anchorage, Alaska, May 17-19, 1978. Proceedings, Vol.2, New York, American Society of Civil Engineers, 1979, p.988-1002.  
Walls, Thermal insulation, Cold weather construction, Buildings, Design.
- 33-4456**  
Self-refrigerated gravel pad foundations. Phukan, A., et al, Conference on Applied Techniques for Cold Environments, Anchorage, Alaska, May 17-19, 1978. Proceedings, Vol.2, New York, American Society of Civil Engineers, 1979, p.1003-1016, 12 refs. Abbott, R.D., Cronin, J.E.  
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- 33-4457**  
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Operation Deep Freeze '79 end of season report. U.S. Naval Support Force, Antarctica, San Francisco, May 9, 1979, var. p. Logistics, Military operation, Cold weather operation.
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This report summarizes the operations of Antarctic Development Squadron Six in support of Deep Freeze '79 for the periods Aug. 23 to Sep. 1978 and Oct. 9, 1978 to Feb. 28, 1979. The following aspects of the operations are described: significant events, air operations, maintenance, logistics, administration, communications, photography, public affairs, medical/dental, detachments, training, safety, and recommendations.
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The importance of tree-ring data from the Southern Hemisphere as a source of paleoclimatic information is assessed. Tree-ring properties of potential worth for paleoclimatic inference include variations in ring width, density, and isotopic composition. It is probable that paleo-climatic information analogous to that found by isotopic analysis of ice cores from Greenland and Antarctica can be obtained from hydrogen isotope determinations of dated wood samples from trees. South America, with its temperate forests extending from Tierra del Fuego to central Chile, offers the greatest immediate potential for application of tree-ring data to paleoclimatic problems in the Southern Hemisphere. Previous studies citing evidence for the correlation of precipitation in Santiago, Chile with snow accumulation at Byrd Station, and the role of the circum-Antarctic ice pack in regulating the position of the circumpolar vortex are noted.
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Ice cores, Volcanic ash, Paleoclimatology, Snow cover. Radiative transfer calculations of the global energy balance have been carried out to estimate the change in mean surface temperature that results from the addition of volcanic aerosols to the stratosphere. The results are consistent with the stratospheric warming observed in the first several months following the eruption of Mt. Agung and the average surface temperature decrease found for the two year period following major volcanic explosions. Changes in the level of volcanic activity appear to be an important factor for the temperature changes that have occurred over the last hundred years and may have contributed to some parts of the last major ice age. Some assessment of the importance of volcanic activity in causing or enhancing the ice ages has been obtained from studies of Greenland and antarctic ice cores.
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Ohata, T., Watanabe, O.  
Snow morphology, Snow cover structure, Seasonal variations.
- 33-4587  
Study of mountain snow cover in the northern part of Kinki district, west Japan.  
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Nakajima, C.  
Snow depth, Snow water equivalent, Seasonal variations.
- 33-4588  
Perennial snow patches of Mount Daisen found in 1977.  
Ageta, Y., *Seppyo*, June 1979, 41(2), p.89-90, In Japanese with English summary.  
Snow cover structure, Snow cover stability.
- 33-4589  
Grain coarsening of snow saturated with solution.  
Tushima, K., et al, *Seppyo*, June 1979, 41(2), p.91-99, In Japanese with English summary. 3 refs.  
Raymond, C.F.  
Snow impurities, Snow water content, Snow crystal structure.
- 33-4590  
Fundamental characteristics of the cosmic-ray snow gauge.  
Kodama, M., *Seppyo*, June 1979, 41(2), p.101-107, In Japanese with English summary. 12 refs.  
Snow gauges, Corpuscular radiation, Snow water equivalent, Neutrons.
- 33-4591  
Continuous observations of water-equivalent of snow-depth by cosmic-ray snow gauge.  
Kodama, M., et al, *Seppyo*, June 1979, 41(2), p.109-114, In Japanese with English summary. 8 refs.  
Nakai, K., Kumanashi, J., Kamota, F., Sato, S.  
Snow gauges, Corpuscular radiation, Snow water equivalent.
- 33-4592  
Development of lower-power and direct indication type of cosmic-ray snow gauge.  
Kodama, M., et al, *Seppyo*, June 1979, 41(2), p.115-120, In Japanese with English summary. 6 refs.  
Hirota, S., Mamizu, S., Koide, Y., Hirano, F.  
Snow gauges, Corpuscular radiation, Indicating instruments.
- 33-4593  
Development of water veins along the three-grain intersection in fresh water ice at the melting point.  
Toukairin, A., *Seppyo*, June 1979, 41(2), p.121-130, In Japanese with English summary. 10 refs.  
Ice physics, Ice melting, Melting points, Channels (waterways).
- 33-4594  
Snow glide and damage of avalanche defence structures.  
Ishikawa, M., et al, *Seppyo*, June 1979, 41(2), p.131-141, In Japanese. 5 refs.  
Watanabe, S., Ozeki, Y.  
Snow slides, Avalanches, Avalanche countermeasures, Damage.
- 33-4595  
Example of local features of snow cover in Japan.  
Nakamura, T., *Seppyo*, June 1979, 41(2), p.147-148, In Japanese with English summary.  
Snow cover structure, Snow cover distribution.
- 33-4596  
Gas industry development in the northern Tyumen' region. (Razvitiye gazovoi promyshlennosti severa Tiimenskoi oblasti).  
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Bul'tov, V.S., Tandalov, V.V.  
Economic development, Petroleum industry, Natural gas, Transportation, Pipelines, Roads, Buildings, Permafrost beneath structures, Construction costs.
- 33-4597  
Theory of complex soil stabilization using wood-derived chemical products and industrial wastes. (Voprosy teorii kompleksnogo ukrepleniia gruntov viazhushchimi materialami s primeneniem lesokhimicheskikh reagentov i otkhodov promyshlennosti).  
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- 33-4598  
Natural conditions and resources of East Kazakhstan. (Prirodnye uslovia i estestvennye resursy Vostochnogo Kazakhstana).  
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- 33-4599  
Industrial base of construction in the North. (Industrialnaia baza stroitel'stva Severnoi zony).  
Aparin, I.L., et al, Leningrad, Stroiizdat, 1979, 152p., In Russian with English table of contents enclosed. 10 refs.  
Krinit'skaia, M.E.  
Economic development, Petroleum industry, Construction, Industrial buildings, Construction materials, Manufacturing, Construction costs.
- 33-4600  
Forecasting water temperature in the ocean. (Prognoz temperatury vody v okeane).  
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Skriptunova, L.I.  
Air water interactions, Heat transfer, Forecasting, Water temperature, Ice formation, Ice conditions, Ice navigation.
- 33-4601  
Hydrophysics of inland water bodies. (Gidrofizika vodoemov sushii).  
Odrova, T.V., Leningrad, Gidrometeoizdat, 1979, 311p., In Russian with English table of contents enclosed. 133 refs.  
Icebound lakes, Icebound rivers, Ice cover thickness, Water temperature, Subglacial observations, Heat transfer, Ice accretion, Ice physics, Snow physics, Ice breakup, Ice jams.
- 33-4602  
Proceedings, Vols. 1 and 2.  
International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979, Trondheim, University, 1979, 1414p., For selected papers see 33-4603 through 33-4667.  
Meetings, Sea ice, Shores, Remote sensing, Environmental impact, Oceanography, Meteorology, Ocean waves, Ice mechanics, Soil mechanics, Offshore structures, Oil spills, Ports.
- 33-4603  
Morphology and hazards related to nearshore ice in coastal areas.  
Stringer, W.J., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.1-22.  
Sea ice, Ice structure, Coastal topographic features, Mapping, Ice conditions, Classifications, Petroleum industry.
- 33-4604  
Landfast ice motion observed in the Mackenzie Delta region in the southern Beaufort Sea in the 1972/73 winter.  
Spedding, L.G., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.23-37, 9 refs.  
Fast ice, Drift, Remote sensing, Thermal expansion, Ice cover thickness.
- 33-4605  
Some influences of ice rubble field formations around artificial islands in deep water.  
Allyn, N., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.39-55, 10 refs.  
Wasilewski, B.R.  
Artificial islands, Ice cover strength, Ice mechanics, Drift, Sea ice, Ice (construction material).
- 33-4606  
Ice stresses near grounded structures.  
Sackinger, W.M., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.57-72, 20 refs.  
Nelson, R.D.  
Ice pressure, Offshore structures, Stresses, Ice cover strength, Sea ice.
- 33-4607  
Measurement of sea ice pressures.  
Templeton, J.S., III, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.73-87, 15 refs.  
Ice pressure, Measuring instruments, Sea ice.
- 33-4608  
Model tests of ice rubble strength.  
Prodanovic, A., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.89-105, 11 refs.  
Ice strength, Ice structure, Ice mechanics, Sea ice.
- 33-4609  
Multi year pressure ridges in the Canadian Beaufort Sea.  
Wright, B., et al, MP 1229, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.107-126, 17 refs.  
Hnatiuk, J., Kovacs, A.  
Sea ice, Pressure ridges, Ice structure, Models.  
The findings of a field study designed to generate fundamental data on multi-year pressure ridges in the near shore zone of the Canadian Beaufort Sea are presented. The study investigated the geometry of eleven floating multi-year ridges or ridge fragments and the sail height and keel depth of four additional multi-year ridge fragments. The cross-sections of multi-year ridges with total thicknesses varying between 9.6 and 41.8 m were examined, and the results suggest that they can be adequately represented by one ridge model with a constant sail to keel ratio and geometry. It is also shown that the ice comprising multi-year ridges is solid with the interblock voids existing at the time of their formation being completely filled with ice. The data obtained from this study are being used in the engineering design of exploration and production systems for the Beaufort Sea. In the shallow waters of this area, exploratory drilling from artificial islands has been carried out since 1973, and since 1976, the exploration effort has extended into the deeper waters of the Beaufort Sea, using drillships.

33-4610

Ice pile-up and ride-up on Arctic and subarctic beaches.

Kovacs, A., et al, MP 1230, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.127-146, 22 refs.

Sodhi, D.S.

Sea ice, Shores, Pressure ridges, Ice push.

Information on shore ice pile-up and ride-up in arctic and subarctic waters is presented. Cross-sectional profiles of several ice pile-ups and ride-ups are presented from which models and theoretical analyses were made. The expressions derived give the force required to overcome gravitational potential and friction occurring during ice-piling and ride-up. It was estimated that the distributed force required during ice-piling or ride-up was of the order of 10 to 350 kPa (about 1.5 to 50 psi). Field observations revealed that shore ice pile-up or ride-up appears to occur within a period of less than 30 minutes at any time of year, but most often in the spring and fall. Pile-up seldom occurs more than 10 m inland from the sea, but ride-up frequently extends 50 m or more inland, regardless of ice thickness. While steeply sloping shores do not favor ice ride-up, sea ice has mounted the steep, 9-m-high bluff at Barrow, Alaska, destroying structures and taking lives.

33-4611

Artificial ice islands for exploratory drilling.

Cox, G.F.N., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.147-162, 12 refs.

Artificial islands, Ice islands, Flooding, Offshore structures.

33-4612

On the sea ice conditions in the Greenland and Barents Seas.

Loeng, H., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.163-176, 22 refs.

Vinje, T.E.

Sea ice, Ice conditions, Seasonal variations, Greenland Sea, Barents Sea.

33-4613

Correlation of storms and major ice movements in the nearshore Alaskan Beaufort Sea.

Agerton, D.G., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.177-189, 7 refs.

Kreider, J.R.

Pack ice, Ice conditions, Meteorological data, Storms, Beaufort Sea.

33-4614

Five-year sea ice climatology of the Bering Sea derived from satellite observations.

Barnes, J.C., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.191-205, 7 refs.

Bowley, C.J.

Sea ice, Ice conditions, Spaceborne photography, Climatology, Bering Sea.

33-4615

Aerial reconnaissance and subsea profiling of sea ice in the Bering Sea.

Deily, F.H., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.207-219. Sea ice, Aerial reconnaissance, Subglacial observations, Acoustic measuring instruments.

33-4616

Iceberg investigation along the west coast of Greenland.

Dietrich, J., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.221-239. Zorn, R., Nielsen, A.H.

Icebergs, Drift, Ocean currents, Wind factors.

33-4617

Another hypothesis about iceberg draft.

Brooks, L.D., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.241-252, 14 refs.

Icebergs, Measurement, Ice density.

33-4618

Probable ice thickness of the Arctic Ocean.

Blidberg, D.R., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.253-267, 24 refs.

Corell, R.W., Westneat, A.S.

Sea ice, Ice cover thickness, Acoustic measurement.

33-4619

Remote surveillance of the terrestrial environment by electromagnetic waves, a review.

Gjessing, D.T., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.269-287, 21 refs.

Remote sensing, Electromagnetic prospecting, Surface structure, Radar, Radio waves.

33-4620

Airborne radar sounding of Arctic icebergs.

Rossiter, J.R., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.289-305. Also designated C-CORE Publication No.79-10. 12 refs.

Narod, B.B., Clarke, G.K.C.

Icebergs, Airborne radar, Profiles.

33-4621

Tromsø telemetry station—services and applications.

Overgård, A., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.307-312. Telemetering equipment, Stations, Spacecraft.

33-4622

Sea-ice observations by satellite in the Bering, Chukchi, and Beaufort Seas.

Ahlinäs, K., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.313-329, 12 refs.

Wendler, G.

Ice conditions, Ice edge, Spaceborne photography, Sea ice.

33-4623

ADOM ice drilling systems review.

Blidberg, D.R., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.345-358. Corell, R.W., Westneat, A.S.

Ice drills, Sea ice, Aerial delivery, Automatic control.

33-4624

Remote acoustic sensing of Arctic Ocean properties.

Dyer, I., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.359-367, 9 refs. Remote sensing, Acoustic measuring instruments, Bottom topography, Seismic refraction, Backscatter.

33-4625

Some possible effects of Arctic industrial developments on the marine environment.

Lewis, E.L., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.369-392, 37 refs.

Economic development, Oil recovery, Environmental impact, Oil pollution, Mining, Marine biology.

33-4626

Oil pollution in ice-covered Arctic waters.

Weller, G., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.393-406, 9 refs.

Oil pollution, Sea ice, Environmental impact, Submarine permafrost, Ice scoring.

33-4627

Ice effects on oceanographic conditions in Rupert Bay.

Michel, B., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.515-529, 8 refs.

Purves, W., Soucy, A.

Ice cover thickness, Tidal currents, Water temperature, Salinity, Ice cover effect.

33-4628

Spectra of inertial waves for an ice covered mixed layer.

Colony, R., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.531-546, 13 refs.

Ocean currents, Ice cover effect, Drift, Water waves, Boundary value problems, Mathematical models.

33-4629

Flexural and uniaxial compression strength of sea ice in Danish waters.

Tryde, P., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.633-641, 6 refs.

Sea ice, Ice strength, Compressive strength.

33-4630

Existence of oriented sea ice by the Mackenzie Delta.

Vittoratos, E.S., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.643-650, 6 refs.

Sea ice, Ice crystal structure, Compressive strength, Ice islands, Crystal orientation.

33-4631

Crystallographic studies and strength tests of field ice in the Alaskan Beaufort Sea.

Wang, Y.-S., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.651-665, 6 refs.

Sea ice, Ice crystal structure, Crystal orientation, Ice cover strength, Compressive strength.

33-4632

Temperature effect on the uniaxial strength of ice.

Haynes, F.D., MP 1231, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.667-681, 17 refs.

Ice strength, Compressive strength, Tensile strength.

The effect of temperature on the uniaxial strength of fine-grained, polycrystalline ice was investigated. Dumbbell-shaped specimens were loaded in uniaxial compression and uniaxial tension. Two machine speeds, 0.847 mm/s and 84.7 mm/s, were used for the tests, and the test temperatures ranged from -0.1 to -54°C. The uniaxial compressive strength is very sensitive to temperature, generally increasing as the temperature decreased from -0.1°C to -54°C, with the greatest increase between -0.1°C and -3°C. The tensile strength is not very sensitive to temperature, but did continue to increase with decreasing temperature. Tensile strength also increased the most between -0.1°C and -3°C. An initial tangent modulus and a 50% stress modulus were found for each compression test. The initial tangent modulus increased about two times as the temperature decreased from -0.1°C to -54°C. The 50% stress modulus also increased with decreasing temperature. A secant modulus was found for the tensile tests and it tended to decrease with decreasing temperature. The specific energy required to cause failure was also found for the compression and tension tests.

33-4633

Comparison of *in-situ* and laboratory uniaxial fresh water ice strength.

Vittoratos, E.S., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.683-695, 7 refs.

Kry, P.R.

Ice strength, Compressive strength, Strain measuring instruments, Temperature effects.

- 33-4634**  
Plane strain fracture toughness (K<sub>1c</sub>) of fresh water ice.  
Hamza, H., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.697-707, 11 refs.  
Muggeridge, D.B.  
Ice mechanics, Ice strength, Dynamic loads, Temperature effects.
- 33-4635**  
Effect of test system stiffness on strength of ice.  
Sinha, N.K., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.708-717, 6 refs.  
Frederking, R.M.W.  
Ice strength, Test equipment.
- 33-4636**  
Mechanical and morphological properties of doped ice: a search for a better structurally simulated ice for model test basins.  
Timco, G.W., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.719-739, 17 refs.  
Artificial ice, Ice mechanics, Ice structure, Doped ice, Test chambers, Ice strength, Water chemistry.
- 33-4637**  
Friction measurements of sea ice on flat plates of metals, plastics and coatings.  
Tushima, K., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.741-755, 9 refs.  
Tabata, T.  
Sea ice, Metal ice friction, Surface roughness.
- 33-4638**  
Borehole relaxation test as a means for determining the creep properties of ice covers.  
Ladanyi, B., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.757-770, 10 refs.  
Ice creep, Boreholes, Relaxation (mechanics), Analysis (mathematics).
- 33-4639**  
Interfacial tension and contact angle of crude oil under ice.  
Malcom, J.D., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.771-778, 16 refs.  
Dutton, C.R.  
Crude oil, Ice cover, Liquid solid interfaces, Water films.
- 33-4640**  
Creep of floating sea-ice sheets—a finite element formulation.  
Tinawi, R., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.779-795, 22 refs.  
Murat, J.R.  
Sea ice, Floating ice, Ice creep, Ice mechanics, Dynamic loads, Mathematical models.
- 33-4641**  
Buckling analysis of wedge-shaped floating ice sheets.  
Sodhi, D.S., MP 1232, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.1, Trondheim, University, 1979, p.797-810, 7 refs.  
Sea ice, Floating ice, Ice loads, Ice pressure.  
A buckling analysis for semi-infinite wedge-shaped floating ice sheets is presented, considering a radial stress field for the in-plane stresses. The buckling load and buckling pressure are computed for varying ice sheet geometry and boundary conditions. The results of this analysis are close to those of earlier analyses for semi-infinite ice sheets and tapered beams.
- 33-4642**  
Decade of North Sea Foundations.  
De Ruiter, J., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.811-831, 18 refs.  
Offshore structures, Pile foundations, Pile driving, Construction equipment, Concrete structures, North Sea.
- 33-4643**  
Geotechnical survey of the seafloor with a free fall penetrometer.  
Chari, T.R., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.833-843, 15 refs.  
Abdel-Gawad, S.M., Chaudhuri, S.N.  
Bottom sediment, Penetration tests, Impact tests, Sands.
- 33-4644**  
Coarse grained sediment dynamics, Beaufort Sea, Alaska.  
Nummedal, D., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.845-858, 20 refs.  
Sediment transport, Ice push, Storms, Water waves.
- 33-4645**  
Shallow geology of the continental shelf off north Norway.  
Rokoengen, K., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.859-875, 13 refs.  
Marine geology, Geologic structures, Ice scoring, Bottom sediment.
- 33-4646**  
Seabed roughness characterization by broadband acoustic echosounding.  
Cochrane, N.A., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.877-898, 9 refs.  
Dunsiger, A.D.  
Remote sensing, Bottom sediment, Surface roughness, Seismic surveys.
- 33-4647**  
Geological considerations for engineering activities on the Kodiak shelf and upper slope.  
Hampton, M.A., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.935-949, 21 refs.  
Bottom sediment, Geologic structures, Marine geology, Sediment transport.
- 33-4648**  
Geotechnical engineering characteristics of the outer continental shelf lease areas in Alaska.  
Sangrey, D.A., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.963-976, 32 refs.  
Marine geology, Geologic structures, Bottom sediment, Engineering geology, Ice cover effect, Natural gas.
- 33-4649**  
Ship-ice interaction.  
Enkvist, E., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.977-1002, 58 refs.  
Varsta, P., Riska, K.  
Ice breaking, Icebreakers, Ice navigation, Ships, Ice loads, Propellers, Ship icing.
- 33-4650**  
Ice forces and accelerations on a Polar Class ice-breaker.  
Noble, P.G., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.1003-1022, 5 refs.  
Tam, W.K., Menon, B., Bayly, I.M.  
Ice navigation, Icebreakers, Ice pressure, Dynamic loads, Mathematical models.
- 33-4651**  
Ice model tests and computer simulation of propeller-ice impacts of a polar research ship.  
DeBord, F.W., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.1023-1040, 5 refs.  
Lewis, J.W., Voelker, R.P.  
Ice models, Ice navigation, Ships, Propellers, Ice-breakers.
- 33-4652**  
Ice impact loads on steering system components of Arctic class ships.  
Menon, B., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.1041-1068, 13 refs.  
Noble, P.G.  
Ice floes, Icebreakers, Ice loads, Impact tests, Mathematical models.
- 33-4653**  
Ice-breaking mechanisms for ice-breakers and offshore structures.  
Vinogradov, O.G., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.1069-1079, 7 refs.  
Kentfield, J.A.C., Vermeulen, P.J.  
Ice breaking, Icebreakers, Offshore structures, Ice removal equipment.
- 33-4654**  
Experimental study on ice forces on a cone-shaped and an inclined pile structure.  
Saeki, H., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.1081-1095, 6 refs.  
Ono, T., Ozaki, A.  
Offshore structures, Ice breaking, Ice pressure, Pile structures.
- 33-4655**  
Laboratory tests on downdrag loads developed by floating ice covers on vertical piles.  
Frederking, R.M.W., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.1097-1110, 10 refs.  
Floating ice, Ice cover thickness, Ice pressure, Pile structures, Ice mechanics.
- 33-4656**  
Probabilistic force calculations for structures in ice-covered seas.  
Wheeler, J.D., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.1111-1126, 14 refs.  
Offshore structures, Ice pressure, Ice mechanics, Mathematical models, Probability theory.
- 33-4657**  
Generation of smoothed spectrum-compatible ice force records.  
Arockasamy, M., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.1127-1138, 10 refs.  
Reddy, D.V., Bobby, W., Cheema, P.S.  
Ice pressure, Statistical data, Data processing, Computer programs.

- 33-4658**  
Laboratory tests for dynamic ice-structure interaction.  
Mänttinen, M., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.1139-1153, 5 refs.
- Ice solid interface, Pile structures, Ice pressure, Dynamic loads.**  
For bottom-founded structure simulation, a test pile was designed so that its stiffness, natural frequencies and modes and damping could be varied. The ice movement against the pile was arranged to have constant acceleration in order to excite different modes with different ice velocities. The flexibility of the drive system caused jerking ice movement with low velocities. Analysis of the recorded ice forces and acceleration includes the refinement at measured ice forces by eliminating the response of the measuring system itself, using dynamic equilibrium or transfer function approach. The frequency contents and the damping of vibrations are analyzed using Fourier signal analyzer. Results thus far show simultaneity with in-field ice force histograms: both random and saw-tooth like repetitive ice force fluctuations appear. The change from one interaction mode to the other with increasing drive velocities occurs. With high velocities relatively smooth random ice crushing occurs, and in some cases natural modes are stable. The greatest energy content of ice force does not always appear with the natural frequencies of structures.
- 33-4659**  
Non-stationary response of offshore towers to ice forces.  
Reddy, D.V., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.1155-1171, 16 refs.
- Arockiasamy, M., Cheema, P.S.**  
Offshore structures, Loads (forces), Ice pressure, Analysis (mathematics).
- 33-4660**  
Conceptual design of floating drilling production and storage caisson for Arctic waters.  
Gerwick, B.C., Jr., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.1173-1189, 7 refs.
- Jahns, H.O.**  
Caissons, Offshore structures, Ice pressure, Offshore drilling, Sea ice.
- 33-4661**  
Preliminary design of the Arctic mobile drilling structure.  
Hancock, J.A., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.1191-1204, 4 refs.
- Hudson, T.A., Van Scherpe, P.H., Sterdum, R.E.**  
Ice pressure, Offshore drilling, Offshore structures, Sea ice.
- 33-4662**  
Fast ice thickness and snow depth relationships related to oil entrapment potential, Prudhoe Bay, Alaska.  
Barnes, P.W., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.1205-1225, 14 refs.
- Reimnitz, E., Toimil, L.J., Hill, H.R.**  
Fast ice, Ice cover thickness, Ice bottom surface, Snow depth, Oil pollution.
- 33-4663**  
Oil spill on the shore of an ice-covered fjord in Spitsbergen.  
Carstens, T., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.1227-1242, 21 refs.
- Sendstad, E.**  
Oil spills, Ice cover effect, Environmental impact.
- 33-4664**  
Development of winter navigation in the St. Lawrence River below Montreal.  
Dany, J.V., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.1243-1256, 6 refs.
- Rivers, Ice navigation, Icebreakers, Ice control.**
- 33-4665**  
Concepts for ice management at Arctic LNG terminal.  
Cammaert, A.B., et al, International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.1257-1268, 4 refs.
- Miller, D.R., Gill, R.J.**  
Natural gas, Storage, Ports, Ice formation, Ice control, Heat recovery.
- 33-4666**  
Design of harbor structures for boats.  
Wortley, C.A., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.1283-1300, 9 refs.
- Ports, Ice pressure, Ice control, Docks, Design criteria, Great Lakes.**
- 33-4667**  
Wave mechanics principles on the design of rubble-mound breakwaters.  
Gunbak, A.R., International Conference on Port and Ocean Engineering Under Arctic Conditions, 5th, Trondheim, Norway, Aug. 13-18, 1979. Proceedings, Vol.2, Trondheim, University, 1979, p.1301-1318, 29 refs.
- Ports, Protection, Wave propagation, Mechanical properties.**
- 33-4668**  
Physiological adaptation to the environment.  
Symposium on Physiological Adaptation to the Environment, Amherst, University of Massachusetts, June 20-22, 1973, New York, Intext Educational Publishers, 1975, 576p., Refs. passim. For selected papers see 32-628, 32-671 and 33-4669 through 33-4672.
- Vernberg, F.J., ed.**  
Ecology, Tundra, Cold tolerance, Plant physiology, Animals, Birds, Insects.
- 33-4669**  
Physiological ecology of Arctic and alpine photosynthesis and respiration.  
Tieszen, L.L., et al, Physiological adaptation to the environment. Edited by F.J. Vernberg. New York, Intext Educational Publishers, 1975, p.157-200, Refs. p.194-200.
- Wieland, N.K.**  
Arctic vegetation, Alpine vegetation, Tundra vegetation, Plant physiology, Plant ecology, Photosynthesis.
- 33-4670**  
Arctic and alpine plant water relations.  
Courtin, G.M., et al, Physiological adaptation to the environment. Edited by F.J. Vernberg. New York, Intext Educational Publishers, 1975, p.201-224, Refs. p.220-224.
- Mayo, J.M.**  
Arctic vegetation, Alpine vegetation, Tundra vegetation, Plant physiology, Plant ecology, Cold tolerance, Climatic factors, Environments.
- 33-4671**  
Some aspects of nutritional adaptations of Arctic herbivorous mammals.  
White, R.G., Physiological adaptation to the environment. Edited by F.J. Vernberg. New York, Intext Educational Publishers, 1975, p.239-268, Refs. p.261-268.
- Animals, Arctic vegetation, Tundra vegetation, Nutrient cycle, Seasonal variations, Physiology.**
- 33-4672**  
Metabolic adaptations of tundra birds.  
West, G.C., et al, Physiological adaptation to the environment. Edited by F.J. Vernberg. New York, Intext Educational Publishers, 1975, p.301-329, Refs. p.325-329.
- Norton, D.W.**  
Ecology, Tundra, Acclimatization, Birds.
- 33-4673**  
Estimated snow, ice, and rain load prior to the collapse of the Hartford Civic Center arena roof.  
Redfield, R.K., et al, U.S. Army Cold Regions Research and Engineering Laboratory, Apr. 1979, SR 79-9, 32p., ADA-069 323, 19 refs.
- Tobiasson, W.N., Colbeck, S.C.**  
Roofs, Loads (forces), Snow loads, Ice loads, Rain. The roof of the Hartford, Connecticut, Civic Center Arena collapsed under an unknown load of snow, ice and rain early in the morning on Jan. 18, 1978. Based on available meteorological and snow load measurements, estimates for the amount of load present at the time of failure are made using a number of techniques. In addition, previous maximum loads due to snow, ice or rain since the building was constructed are also estimated.
- 33-4674**  
Standing crop of algae in the sea ice of the Weddell Sea region.  
Ackley, S.F., et al, Deep-sea research, Mar. 1979, 26(3A), MP 1242, p.269-281, c.
- Buck, K.R., Taguchi, S.**  
Sea ice, Algae, Cryobiology, Weddell Sea. Physical and biological measurements were made of sea ice cores taken from 69 to 78 S in the Weddell Sea. Fluorescence measurements indicated an algal community that was strongly associated with salinity maxima within the ice. Maximum concentrations of chlorophyll *a* ranged from 0.31 to 4.54 mg cu m. Comparisons with standing crops in the water column indicate that the standing crop within the ice can represent a minor but significant fraction of the total standing crop for the region. The sea ice algal community is apparently distinct from others that have been described for land-fast ice in McMurdo Sound, sea ice in the Arctic, and pack ice off East Antarctica. The highest concentrations of biological material are found in the bottom or top samples from those regions, whereas the Weddell Sea maxima are concentrated at intermediate depths (0.65 to 2.15m) within the ice. A qualitative model indicating the relationship between thermally induced brine migration and subsequent algal growth is presented. (Auth. mod.)
- 33-4675**  
In vitro digestibility of forages utilized by Rangifer tarandus.  
Person, S.J., et al, Alaska. University. Biological papers. Special report No.1, International Reindeer and Caribou Symposium, 1st, Fairbanks, Alaska, Aug. 9-11, 1972. Proceedings. Edited by J.R. Luick, et al, Sep. 1975, p.251-256, 15 refs.
- White, R.G., Luick, J.R.**  
Animals, Lichens, Grasses, Ecology, Laboratory techniques, Physiology.
- 33-4676**  
Volatile fatty acid (VFA) production in the rumen and cecum of reindeer.  
White, R.G., et al, International Reindeer and Caribou Symposium, 1st, Fairbanks, Alaska, Aug. 9-11, 1972. Proceedings. Edited by J.R. Luick, et al, Alaska. University. Biological papers. Special report No.1, Sep. 1975, p.284-289, 8 refs.
- Gau, A.M.**  
Animals, Lichens, Grasses, Ecology, Physiology.
- 33-4677**  
Ecology of tundra invertebrates at Prudhoe Bay, Alaska.  
MacLean, S.F., Jr., Alaska. University. Biological papers. Special report No.2, Oct. 1975, p.114-123, 7 refs.
- Ecology, Tundra, Biomass, Insects.**
- 33-4678**  
Physiological aspects of the ecology of *Dicranum fuscescens* in the Subarctic. 1. Acclimation and acclimation potential of CO<sub>2</sub> exchange in relation to habitat, light, and temperature.  
Hickleton, P.R., et al, Canadian journal of botany, May 15, 1976, 54(10), p.1104-1119, 46 refs.
- Oechel, W.C.**  
Subarctic vegetation, Mosses, Plant ecology, Photosynthesis, Carbon dioxide, Light effects, Temperature effects.
- 33-4679**  
Comparative CO<sub>2</sub> exchange patterns in mosses from two tundra habitats at Barrow, Alaska.  
Oechel, W.C., et al, Canadian journal of botany, June 15, 1976, 54(12), p.1355-1369, In English with French summary. 38 refs.
- Collins, N.J.**  
Tundra vegetation, Arctic vegetation, Mosses, Plant physiology, Photosynthesis, Carbon dioxide, Light effects, Temperature effects, Water content, United States—Alaska—Barrow.
- 33-4680**  
Two Soviet recoveries of Dunlins banded at Point Barrow, Alaska.  
Norton, D.W., Auk, Oct. 1971, 88(4), p.927.
- Ecology, Biogeography, Migration, Animals, Polar regions.**
- 33-4681**  
Methods of determining astronomical coordinates and land navigation in Antarctica. (Metody opredeleniya astronomicheskikh koordinat i voprosy nazemnoi navigatsii v Antarktide).  
Lazarev, G.E., Moscow, Nauka, 1977, 146p., In Russian with English table of contents enclosed. Refs. p.143-145.
- Navigation, Mapping, Geodesy, Geodetic surveys, Indicating instruments, Instruments, Antarctica.** Aspects of working with high-precision astronomical and geodetic instruments and of receiving exact-time signals in Antarctica are discussed. By analyzing physical and geographical conditions, the author is able to make recommendations about methods of determining latitude, longitude and azimuth. Techniques for coordinate determination on traverse, the feasibility of determining coordinates from a single station, and the use of celestial navigation are also discussed.

bility of maintaining course direction and distance measurement and the use of navigational devices for land transport are considered.

## 33-4682

Leveling under unfavorable conditions during artificial settlement of a house foundation. (Opyt nivelirovaniya v neblagopriyatnykh usloviyakh pri iskusstvennoi posadke domov). Kamnev, A.V., et al, *Altayskii politekhnicheskii institut. Trudy*, 1973, Vol.27, p.66-69, In Russian. Guliaev, I.U.F.  
Cold weather construction, Clay soils, Soil compacting, Foundations, Settlement (structural), Leveling.

## 33-4683

Policy of the B.E. Vedenev Hydraulics Institute in studies of hydraulic structure foundations and earth dams. (Osnovnye zadachi issledovaniy VNIIG im. B.E. Vedeneva v oblasti osnovaniy gidrotekhnicheskikh sooruzhenii i gruntovykh plotin). Skladnev, M.F., et al, *Leningrad. Vsesoiuznyi nauchno-issledovatel'skii institut gidrotekhniki. Izvestia*, 1978, Vol.122, p.3-11, In Russian. Evdokimov, P.D., Sapegin, D.D.  
Hydraulic structures, Concrete structures, Earth dams, Ice (construction material), Permafrost beneath structures, Research projects.

## 33-4684

Calculating consolidation of rock-filled dam cores allowing for soil creep (two-dimensional problem). (Raschet konsolidatsii iader plotin s uchedom polzuchesti skeleta grunta (ploskaia zadacha)). Kotochigov, A.M., et al, *Leningrad. Vsesoiuznyi nauchno-issledovatel'skii institut gidrotekhniki. Izvestia*, 1978, Vol.122, p.65-68, In Russian. 3 refs. Lykova, N.I.  
Hydraulic structures, Earth dams, Rock fills, Soil compacting, Creep properties, Design.

## 33-4685

Calculating nonsteady seepage in earth dams. (Raschet neustanovivshiesia fil'tratsii v gruntovykh plotinakh). Mozhevitinov, A.L., et al, *Leningrad. Vsesoiuznyi nauchno-issledovatel'skii institut gidrotekhniki. Izvestia*, 1978, Vol.122, p.69-75, In Russian. Suleimanov, I.A.-G.  
Hydraulic structures, Earth dams, Rock fills, Slope stability, Seepage, Analysis (mathematics).

## 33-4686

Constructing grout curtains in calcareous rocks. (Opyt sordaniia protivofil'tratsionnoi zavesy v karbonatnykh porodakh). Demin, V.F., et al, *Leningrad. Vsesoiuznyi nauchno-issledovatel'skii institut gidrotekhniki. Izvestia*, 1978, Vol.122, p.81-85, In Russian. 5 refs. Popov, I.U.D., Allas, E.E.  
Hydraulic structures, Soil stabilization, Waterproofing, Cements, Resins, Grouting.

## 33-4687

Calculating horizontal shift of rigid hydraulic structures allowing for foundation creep. (K voprosu rascheta gorizontallykh smeshchenii zhestkikh napornykh gidrosooruzhenii uchedom svoistv polzuchesti grunta osnovaniia). Aptekar', L.D., *Leningrad. Vsesoiuznyi nauchno-issledovatel'skii institut gidrotekhniki. Izvestia*, 1978, Vol.122, p.86-91, In Russian. 7 refs.  
Hydraulic structures, Foundations, Clays, Creep properties, Water pressure, Design.

## 33-4688

Proceedings, Vol.2.  
International Conference on Iceberg Utilization for Fresh Water Production, Weather Modification, and Other Applications, 1st, Iowa State University, Ames, October 2-6, 1977. *Desalination*, Apr.-May 1979, 29(1/2), 231p., Refs. For selected papers see 33-4689 through 33-4700 or F-22080 through F-22087.  
Ice (water storage), Water supply, Transportation, Weather modification, Economic development, Iceberg towing.  
This volume of 17 papers and abstracts, together with the first volume of the proceedings (F-20448 or 32-4707) presents various aspects of iceberg technology and its potential applications. The aim of the work included in this volume is to gain more understanding of tabular icebergs, their sources, properties and behavior, and to exchange views on plausible efficient ways of employing icebergs as a water resource. Other uses for icebergs which might be contemplated are for power generation, weather modification, mitigation of thermal effects, provision of suitable environment for mariculture, and recreation purposes (floating islands).

## 33-4689

Water supply and weather modifications from transferred iceberg from Antarctica to countries of the world's "thirst belt". Victor, P.-E., *Desalination*, Apr.-May 1979, 29(1/2), International Conference on Iceberg Utilization for Fresh Water Production, Weather Modification, and Other Applications, 1st, Iowa State University, Ames, October 2-6, 1977. Proceedings, Vol.2, p.7-15.  
Ice (water storage), Water supply, Transportation, Weather modification, Economic development, Iceberg towing.

The use of antarctic icebergs as a source of fresh water and as a microclimate modifier is proposed. The production of fresh water from icebergs is believed to have only beneficial aspects. Only tabular icebergs are suitable for transport. The annual production of such icebergs is probably more than 10,000 (which melt away). Towing of such masses (100 million m<sup>3</sup> as a first step) is possible with existing tugs. Protection against excessive melting during transfer (6 to 8 months) is given, theoretically, by a "shell" maintaining a pool of cold water under and around the "foot" of the iceberg. Economically, the cost of iceberg produced water is competitive with the cost of water delivered by desalination. Study of the proposed operation and all of its phases leads to the conclusion that it is technically feasible and economically sound. (Auth. mod.)

## 33-4690

Terradynamics as applied to ice. Pope, A., *Desalination*, Apr.-May 1979, 29(1/2), International Conference on Iceberg Utilization for Fresh Water Production, Weather Modification, and Other Applications, 1st, Iowa State University, Ames, October 2-6, 1977. Proceedings, Vol.2, p.17-23.  
Icebergs, Sea ice, Glacier ice, Dynamic properties, Ice cover thickness, Penetration tests, Impact tests.

## 33-4691

Icebergs used and theory with suggestions for the future. Day, J.M., *Desalination*, Apr.-May 1979, 29(1/2), International Conference on Iceberg Utilization for Fresh Water Production, Weather Modification, and Other Applications, 1st, Iowa State University, Ames, October 2-6, 1977. Proceedings, Vol.2, p.25-40, 10 refs.

Icebergs, Ice (water storage), Economic development, Iceberg towing.

The use of icebergs as a refrigerant and a water source is reviewed, together with the sequence of events leading up to the present. The methodology of each iceberg theorist is presented and compared. The events and opinions emerging from the first iceberg meeting at Rensselaerville, N. Y., in 1974 are stated. Suggestions are made which could solve some of the problems facing this technology and a new approach to processing and delivery is outlined. (Auth. mod.)

## 33-4692

Eligth voyage aboard *Al Hammal*. A study of the transport of a large tabular iceberg from the Antarctic to the Arabian Peninsula.

Coillet, D.W., et al, *Desalination*, Apr. May 1979, 29(1/2), International Conference on Iceberg Utilization for Fresh Water Production, Weather Modification, and Other Applications, 1st, Iowa State University, Ames, October 2-6, 1977. Proceedings, Vol.2, p.47-78, Refs. p.73-78.

Dunlap, R.M.  
Icebergs, Ice mechanics, Ice (water storage), Transportation, Iceberg towing.

This paper examines the critical parameters in the design of an iceberg-moving tugboat. The projected tow course is outlined and an engineering analysis is presented.

## 33-4693

Towage of an iceberg. Montfort, L., et al, *Desalination*, Apr.-May 1979, 29(1/2), International Conference on Iceberg Utilization for Fresh Water Production, Weather Modification, and Other Applications, 1st, Iowa State University, Ames, October 2-6, 1977. Proceedings, Vol.2, p.79-95, 7 refs.

Oudendijk, C.  
Meteorological factors, Iceberg towing.

This paper discusses the following aspects of iceberg towing: existing towboats and practical experience applicable to iceberg projects, necessary equipment for the transfer, sea and weather conditions, technical considerations, and human problems and safety. It is speculated that an iceberg, towed from the Weddell Sea vicinity to the Gulf of Aden, a voyage of roughly 9000 naut. mi, say, at the speed of one knot, would take approximately one year. Important considerations for such a venture include refueling at sea, tug maintenance, support vessels, equipment to be placed on the berg, etc. These matters are discussed.

## 33-4694

Determination of iceberg underwater shape with impulse radar.

Rossiter, J.R., et al, *Desalination*, Apr.-May 1979, 29(1/2), International Conference on Iceberg Utilization for Fresh Water Production, Weather Modification, and Other Applications, 1st, Iowa State University, Ames, October 2-6, 1977. Proceedings, Vol.2, p.99-107, 14 refs.

Gustajtis, K.A.  
Icebergs, Radar echoes, Ice cover thickness, Sound- ing, Ice dielectrics.

The measurement of iceberg underwater dimensions and features will be essential for safe and effective choice, preparation, and transportation of icebergs. An iceberg's subsurface shape affects its deterioration, its form drag, and its strength. Short-pulse radar echo-sounding methods can be used to sound icebergs since polar fresh-water ice is highly transparent to radio signals. Available radar equipment can be used either from an aircraft or from the iceberg surface, and can provide reliable, easily-interpreted, real-time results. These systems can measure iceberg thickness and can provide information about inhomogeneities, such as crevasses, but further work is required to be able to estimate subsurface shape. This paper reviews the available literature on radio echo sounding of icebergs, including antarctic icebergs.

## 33-4695

Capability of SAR systems for iceberg detection and characterization.

Rawson, R., et al, *Desalination*, Apr.-May 1979, 29(1/2), International Conference on Iceberg Utilization for Fresh Water Production, Weather Modification, and Other Applications, 1st, Iowa State University, Ames, October 2-6, 1977. Proceedings, Vol.2, p.109-133, 16 refs.

Larson, R., Shuchman, R., Worsfold, R.  
Airborne radar, Icebergs, Radar tracking, Ice detection.

## 33-4696

Geophysical aspects of a large iceberg tow.

David, D.C., *Desalination*, Apr.-May 1979, 29(1/2), International Conference on Iceberg Utilization for Fresh Water Production, Weather Modification, and Other Applications, 1st, Iowa State University, Ames, October 2-6, 1977. Proceedings, Vol.2, p.135-152, 8 refs.

Ice melting, Ice (water storage), Water supply, Economic development, Iceberg towing.

This paper describes the hypothetical transport of an antarctic iceberg to Saudi Arabia to illustrate the problems inherent in any tow across tropical waters. The towing route is from the Weddell Sea through the Pacific Ocean and the Arabian Sea to the Gulf of Aden. The following aspects of iceberg utilization are discussed: locating and harnessing, melting, transit, a course and timetable for the tow, and technological problems involved in utilizing water from the iceberg. The approximate cost for the delivery of water from an iceberg of the size chosen for this treatment to Saudi Arabia would be 53.7 cents per cu m, as compared with 80 cents per cu m for fresh water from desalination. Intensive field study is needed on the effects of currents and waves on motion and breakup, and the cost and feasibility of insulating. A trial tow would also be desirable.

## 33-4697

Ice cooled ocean thermal energy conversion plants.

DeMarle, D.J., *Desalination*, Apr.-May 1979, 29(1/2), International Conference on Iceberg Utilization for Fresh Water Production, Weather Modification, and Other Applications, 1st, Iowa State University, Ames, October 2-6, 1977. Proceedings, Vol.2, p.153-163, 11 refs.

Icebergs, Electric power plants, Thermal factors, Cooling systems.

## 33-4698

Role of liquid oxygen explosive in iceberg utilization and development.

Tate, G.L., *Desalination*, Apr.-May 1979, 29(1/2), International Conference on Iceberg Utilization for Fresh Water Production, Weather Modification, and Other Applications, 1st, Iowa State University, Ames, October 2-6, 1977. Proceedings, Vol.2, p.167-172, 3 refs.

Icebergs, Water supply, Oxygen, Ice (water storage), Explosives.

## 33-4699

Iceberg utilization and alternative systems related to fresh water transport—recycling and supplementary desalination.

Looyen, C.D., *Desalination*, Apr.-May 1979, 29(1/2), International Conference on Iceberg Utilization for Fresh Water Production, Weather Modification, and Other Applications, 1st, Iowa State University, Ames, October 2-6, 1977. Proceedings, Vol.2, p.173-189.  
Water supply, Water treatment, Ice (water storage), Economic development, Transportation, Iceberg towing.

The author examines the subject of polar iceberg utilization and considers various plans for treating and transporting iceberg

waters to Saudi Arabia. It is suggested that an iceberg ready for transport could be wrapped in a plastic diaper-like bag which would hold the melting fresh water, allowing it to subsequently be pumped away to shore reservoirs. Techniques of water recycling and desalination using solar power are examined and illustrated. The modes of transport considered include a submerged sea train and tankers. A system based on the conversion of in-use and new tankers for loading water and/or oil is described. It is further suggested that possible alternate solutions to Saudi Arabia's water problems may be found in close-by regions, i.e., the Nile River and under Egypt's desert.

## 33-4700

**Integrated ice-water system.**  
Coillet, D.W., *Desalination*, Apr.-May 1979, 29(1/2), International Conference on Iceberg Utilization for Fresh Water Production, Weather Modification, and Other Applications, 1st, Iowa State University, Ames, October 2-6, 1977. Proceedings, Vol.2, p.191-196. Icebergs, Water supply, Ice (water storage), Cost analysis.

A study is made of the possible impact on the Arabian Peninsula of implementing, to a scale growing over 20 years to 3,000 million metric tons annually, the transportation to coastal ports of antarctic icebergs and the reticulation of water harvested from this source. Issues discussed include data collection, preparation of the load, and its navigation at sea and in confined channels. One version of staging, embayment, and harvesting was adopted for the study. The operation of onshore impoundment and pipelines was analyzed in detail, especially with respect to conjunctive seasonal supplies from all sources, and their use patterns. (Auth. mod.)

## 33-4701

**Underwater profiling of icebergs using submersibles.**  
Sukhov, B.P., *Oceans '78*, The Ocean Challenge, Washington, D.C., Marine Technology Society, 1978, p.225-230, 9 refs. Icebergs, Underwater ice, Underwater acoustics, Measurement.

## 33-4702

**SAR imaging of waves in ice.**  
Dave, B.R., et al, *Oceans '78*, The Ocean Challenge, Washington, D.C., Marine Technology Society, 1978, p.379-384, 8 refs. Parashar, S.K. Sea ice, Radar echoes, Ocean waves.

## 33-4703

**Influence of subgrade properties on frost heave.**  
Jones, R.H., et al, *Highways and public works*, July 1979, 47(1832), p.17-22, 15 refs. Berry, A.N. Frost heave, Soil moisture, Low temperature tests, Subgrade soils, Frost resistance.

## 33-4704

**Mathematical model for Lake Bonney, Antarctica.**  
Howell, L.W., Jr., Blacksburg, Virginia Polytechnic Institute and State University, 1977, 326p., University Microfilms order No.78-01587, Ph.D. thesis. Refs. p.110-113.

**Limnology, Frozen lakes, Biomass, Computer applications, Mathematical models, Antarctica—Bonney, Lake.**

During limnological study in 1971-1976, numerous aspects of Lake Bonney's chemical, physical, and biological features from November through January were studied. The project goals consisted of characterizing the Lake's chemical, physical and biological features and the development of a mathematical model of the Lake ecosystem. The present work is the mathematical model, which consists of 21 simultaneous differential equations, 21 parametric equations, and 180 coefficients. A computer program has been written which numerically approximates the solutions to the differential equations, the results appearing as graphs or in tabular form. In addition, graphs of many of the parametric equations are available. The model may be adapted to similar lakes by changing the appropriate coefficients and parametric equations.

## 33-4705

**Glaciers of the Alps.** (Gletscher der Alpen), Bachmann, R.C., Bern, Hallwag, 1978, 304p., In German. c150 refs. Mountain glaciers, Alpine glaciation, Glacier movement, Glacial deposits, Glacier tongues, Alpine vegetation, Moraines.

## 33-4706

**Additional ground truth activities and aids to SAR imagery interpretation, Hopedale, Labrador, Winter 1977.**

Strong, D.C., et al, *Memorial University of Newfoundland, Centre for Cold Ocean Resources Engineering. C-CORE publication*, Apr. 1978, 77-36, 68p., 12 refs. Worsfold, R.D.

**Radar echoes, Sea ice distribution, Ice sheets, Ice physics, Snow cover distribution, Snow physics, LANDSAT, Photography.**

## 33-4707

**Is Antarctica really the last treasury of mankind.** (Ist die Antarktis wirklich die letzte Schatzkammer der Menschheit?).

Tessensohn, F., *Umschau*, Apr. 15, 1979, 79(8), p.248-253, In German with English summary. 6 refs. Natural resources, Minerals, Exploration, Engineering geology.

Many articles appearing in the press during the last months gave the impression of Antarctica being the last source on earth for all kinds of natural resources, the "last treasury of mankind". These statements are critically tested in this article by summing up the facts on the so far known occurrences of mineral resources in Antarctica and the difficulties which a possible commercial exploitation of a mineral deposit would encounter. It is concluded, that mineral exploitation in Antarctica is unlikely in the near future, but research carried out now might well pay off for coming generations. (Auth.)

## 33-4708

**Experimental measurements of sea ice failure stresses near grounded structures.**

Sackinger, W.M., et al, Fairbanks, University of Alaska, 1978, 85p., 18 refs. This report also included in Environmental assessment of the Alaskan continental shelf, Vol.1. Physical science studies. Principal investigators' final reports, March 1979, p.31-121. Nelson, R.D.

**Sea ice, Ice strength, Stresses, Measuring instruments, Pack ice, Remote sensing, Telemetering equipment.**

## 33-4709

**Waste heat capture study.**  
Robert W. Retherford Associates, Anchorage, Alaska, 1978, 115p. + 72p. appendix, Numerous refs. DLC TJ260.R6 1978

**Heat recovery, Heat sources, United States—Alaska.**

## 33-4710

**Intramolecular potential of water molecules engaged in hydrogen bonding from analysis of the overtone spectrum of ice I.**

Seats, M.G., et al, *Journal of chemical physics*, July 15, 1979, 71(2), p.973-982, 37 refs.

**Rice, S.A. Ice formation, Water chemistry, Hydrogen bonds.**

## 33-4711

**On the role of Fermi resonance in the spectrum of water in its condensed phases.**

Seats, M.G., et al, *Journal of chemical physics*, July 15, 1979, 71(2), p.983-990, 38 refs.

**Stavola, M., Rice, S.A. High pressure ice, Amorphous ice, Spectra, Resonance.**

## 33-4712

**Simulation of inertial oscillation in drifting pack ice.**  
McPhee, M.G., *Dynamics of atmospheres and oceans*, May 1978, 2(2), p.107-122, 14 refs.

**Pack ice, Drift, Ocean currents, Mathematical models, Mass transfer, Wind pressure.**

## 33-4713

**Engineering geology of the USSR.** Vol.7, Central Asia. (Inzhenernaia geologiya SSSR. Tom sed'moi. Sredniia Azia).

Tuliaganov, Kh.T., ed, Moscow, Universitet, 1978, 351p., In Russian with English table of contents enclosed. Refs. p.346-349.

**Teush, R.P., ed, Khodzhibayev, N.N., ed. DLC TA705.4.R9159**

**Alpine land forms, Engineering geology, Mountain glaciers, Rock streams, Solidification, Roads, Railroads, Buildings, Avalanches, Firn fields, Environmental protection, USSR—Central Asia.**

## 33-4714

**Determining effective technological schemes for cutter-bar excavators working in frozen ground.** (Metodika opredeleniia ratsional'nykh tekhnologicheskikh skhem razrabotki mernzlogo grunta s primeneniem osarovykh zemlerenzykh mashin), Basov, I.G., *Tomsk. Politeknicheskii institut. Izvestiia*, 1968, Vol.158, p.55-58, In Russian. Earthwork, Excavating equipment, Frozen ground.

## 33-4715

**Ultimate working regimes of cutter-bar excavators for frozen ground.** (O predel'nykh rezhimakh raboty barovogo ispolnitel'nogo organa pri rezanii mernzlogo grunta), Basov, I.G., *Tomsk. Politeknicheskii institut. Izvestiia*, 1968, Vol.158, p.55-58, In Russian. 2 refs.

**Earthwork, Excavating equipment, Frozen ground.**

## 33-4716

**Cratering and ditching in frozen soils.**  
Riddoch, R.G., Kingston, Ont., Royal Military College of Canada, June 1979, 213p., M.E. thesis. Refs. p.191-195.

**Frozen ground strength, Blasting, Excavation, Drilling, Fracturing, Earthwork, Compressive strength, Cold weather construction, Permafrost beneath structures, Explosion effects, Design.**

## 33-4717

**Introduction to the rheology of snow.** (Introduction à la rhéologie de la neige).

Montmollin, V. de, Grenoble, Université scientifique et médicale, 1978, 285p., Ph.D. thesis. In French with English summary. 35 refs.

**Snow surveys, Snow creep, Rheology, Snow mechanics, Metamorphism (snow), Shear properties, Wave propagation.**

## 33-4718

**Sixth Conference-Seminar on the Exchange of Experience in Construction under Severe Climatic Conditions.** Proceedings. Vol.4, No.1.

Soveshchanie-seminar po obmenu opytom stroitel'stva v surovyykh klimaticheskikh usloviyakh, 6, Krasnoyarsk, 1970, Krasnoyarsk, 1970, 115p., In Russian. For individual papers see 33-4719 through 33-4731. Refs. passim.

**DLC TH5.S69**

**Construction materials, Steel structures, Welding, Cold weather construction, Buildings, Walls, Panels, Aluminum, Thermal insulation, Rubber, Roofs, Wood, Wooden structures, Prefabrication, Wind pressure.**

## 33-4719

**New low-alloy nitrogen-vanadium semi-killed steel for welded structures designed for the Far North.** (Novaia nizkolegirovannaiia azotistovanadiievaia poluspokoinkaia stal' dlia svarnykh stroitel'nykh konstruktii, prednaznachennykh dlia raboty v usloviyakh Severa), Pavlov, V.V., et al, *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovyykh klimaticheskikh usloviyakh, 6, Krasnoyarsk, 1970* (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970), 1970, 4(1), p.5-15, In Russian. 4 refs.

**Zhemchuzhnikov, G.V. DLC TH5.S69**

**Steels, Welding, Steel structures, Cold weather performance.**

## 33-4720

**Effect of technological defects on static strength of welded joints at low temperatures.** (Vlianie tekhnologicheskikh defektov na staticheskuu prochnost' svarnykh soedinenii, rabotaisuchikh v usloviyakh nizkikh temperatur), Kotenko, E.V., et al, *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovyykh klimaticheskikh usloviyakh, 6, Krasnoyarsk, 1970* (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970), 1970, 4(1), p.16-27, In Russian. 8 refs.

**Zhemchuzhnikov, G.V., Girenko, V.S. DLC TH5.S69**

**Steel structures, Welding, Frost resistance, Joints (junctions), Defects, Cold weather construction.**

## 33-4721

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**DLC TH5.S69**

**Steel structures, Welding, Joints (junctions), Frost resistance.**

- 33-4722**  
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DLC TH5.S69  
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DLC TH5.S69  
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- 33-4724**  
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DLC TH5.S69  
Roofs, Panels, Metals, Thermal insulation.
- 33-4725**  
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- 33-4726**  
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DLC TH5.S69  
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- 33-4727**  
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DLC TH5.S69  
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DLC TH5.S69  
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DLC TH5.S69  
Construction materials, Plastics, Admixtures, Wood, Wastes, Strength, Frost resistance.
- 33-4730**  
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DLC TH5.D69  
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- 33-4733**  
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- 33-4734**  
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- 33-4735**  
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Concrete structures, Industrial buildings, Walls, Cellular concretes, Panels, Thermal insulation, Design.
- 33-4736**  
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Oganian, K.M., Shliapin, B.B.  
Buildings, Walls, Panels, Cellular concretes, Thermal insulation, Design.
- 33-4737**  
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Permafrost beneath structures, Floors, Thermal regime, Buildings.
- 33-4738**  
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- 33-4739**  
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Walls, Panels, Aluminum, Thermal insulation, Roofs, Joints (junctions), Thermal regime, Humidity.
- 33-4742**  
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- 33-4743**  
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- 33-4744**  
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Walls, Panels, Moisture, Thermal regime, Permafrost beneath structures, Industrial buildings.
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Residential buildings, Walls, Panels, Wooden structures, Permafrost beneath structures.
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Shplet, N.G.  
DLC TH5.S69  
Roofs, Attics, Thermal insulation, Residential buildings.
- 33-4751**  
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Residential buildings, Panels, Aluminum, Thermal regime, Thermal insulation, Permafrost beneath structures.
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Krylov, B.A.  
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Prestressed concrete, Reinforced concrete, Concrete freezing, Concrete hardening, Deformation.
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Cements, Chemical composition, Electric heating, Phase transformations, Structures, Hardness.

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Elastic heating units for thermal treatment of concretes. (Opyt primeneniya gibkikh elektronagrevatelei pri teplovoi obrabotke betona), Mironov, S.A., et al, *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovyykh klimaticheskikh usloviyakh*, 6, Krasnoyarsk, 1970 (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970), 1970, 4(3), p.92-98, In Russian.

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DLC TH5.S69

Concrete heating, Electric heating, Concrete admixtures, Winter concreting, Concrete hardening, Prefabrication.

33-4761

Durability of reinforced concrete piles under severe climatic conditions. (K voprosu o dolgovechnosti zhelezobetonnykh svai v surovyykh klimaticheskikh usloviyakh), Snezhko, Z.P., *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovyykh klimaticheskikh usloviyakh*, 6, Krasnoyarsk, 1970 (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970), 1970, 4(3), p.99-106, In Russian. 2 refs.

DLC TH5.S69

Concrete piles, Reinforced concrete, Pile foundations, Concrete freezing, Concrete strength.

33-4762

Thermal deformations and frost resistance of lightweight concretes with porous aggregates in the Far North. (Temperaturnye deformatsii i morozostoiokost' legkikh betonov na poristykh zapolniteliakh v usloviyakh Kralnego Severa), Abramova, P.S., et al, *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovyykh klimaticheskikh usloviyakh*, 6, Krasnoyarsk, 1970 (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970), 1970, 4(3), p.107-113, In Russian. 2 refs.

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Lightweight concretes, Concrete aggregates, Frost resistance, Freeze thaw cycles, Concrete strength.

33-4763

Studying properties of aerated haydite concrete for construction in the Yakut ASSR. (Rezultaty izucheniya svoystv porizovannogo keramzitobetona dlia stroitel'stva v Iakutskoi ASSR), Zaslavskaya, A.S., *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovyykh klimaticheskikh usloviyakh*, 6, Krasnoyarsk, 1970 (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970), 1970, 4(3), p.114-123, In Russian. 2 refs.

DLC TH5.S69

Cellular concretes, Cements, Lightweight concretes, Frost resistance.

33-4764

Experimentation with using aerated concretes with dense aggregates instead of coarsely porous concretes in the Far North. (Opyt issledovaniia i vnedreniia na Kralnem Severe porizovannogo betona na plotnykh zapolniteliakh vzamen krupnoporistogo betona), Buzhevich, G.A., et al, *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovyykh klimaticheskikh usloviyakh*, 6, Krasnoyarsk, 1970 (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970), 1970, 4(3), p.124-134, In Russian.

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33-4765

Durability of cellular concrete structures. (O dolgovechnosti konstruktii iz lacheistykh betonov), Baranov, A.T., *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovyykh klimaticheskikh usloviyakh*, 6, Krasnoyarsk, 1970 (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970), 1970, 4(3), p.135-139, In Russian.

DLC TH5.S69

Cellular concretes, Lightweight concretes, Concrete aggregates, Wastes, Prefabrication, Frost resistance, Concrete strength.

33-4766

Ultimate water content in plastically flowing mixtures for frost resistant concretes. (Predel'noe vodosoderzhanie plastichnolitoi betonnoi smesi dlia morozostoiokogo betona), Akhmylovskii, B.A., *Soveshchanie-seminar po obmenu opytom stroitel'stva v surovyykh klimaticheskikh usloviyakh*, 6, Krasnoyarsk, 1970 (Conference-seminar on the exchange of experience in construction under severe climatic conditions, 6th, Krasnoyarsk, 1970), 1970, 4(3), p.140-154, In Russian. 8 refs.

DLC TH5.S69

Concrete freezing, Concrete aggregates, Frost resistance, Tests, Concretes, Water content.

33-4767

Deposition and accumulation of plutonium isotopes in Antarctica.

Cutter, G.A., et al, *Nature*, June 14, 1979, 279(5715), p.628-629, 17 refs.

Bruland, K.W., Risebrough, R.W.

Snow composition, Snow impurities, Radioactive isotopes, Fallout.

Data are presented on the deposition of plutonium isotopes from the atmosphere at Dome C on the high antarctic plateau. The activities of Pu-239+240 and Pu-238 versus snow depth are plotted and discussed. The period of peak fallout of Pu-239+240 occurred during 1955-59 and appears to be representative of weapons tests at Bikini and Eniwetok. The Apr. 1964 burnup of a satellite (SNAP-9A) containing 17 kCi of Pu-238 in the southern stratosphere is recorded as a rapid activity in the 1965-66 stratum in the snow record of Pu-238 at Dome C. The profiles suggest that almost all of the plutonium isotopes injected into the atmosphere have now been removed. The activities of both Pu-239+240 and Pu-238 deposited during 1976 at Dome C were only 1.4% of the activities deposited during the respective periods of maximum fallout.

33-4768

Ice cores and climatic change.

Robin, G. de Q., *Royal Society of London. Philosophical transactions. Series B*, 1977, Vol.280, p.143-168, 44 refs.

Ice sheets, Ice cores, Climatic changes, Ice dating, Glacial geology, Paleoclimatology, Antarctica—Byrd Station, Antarctica—Vostok Station.

The paper deals primarily with the use of stable isotopic ratios to determine the former climate of ice sheets. Studies of temperature profiles throughout ice sheets have shown that for at least several thousand years, changes of isotopic delta ratios have been proportional to changes of surface temperatures; this relationship is discussed in terms of the physical processes involved. It is considered reasonable to use a similar relation for earlier periods in Antarctica, but in Greenland the relation may have varied with time. When determining past climates from the isotopic record, allowance must be made for changes in the flow and thickness of ice sheets during major glacial periods. These factors are considered in relation to major ice cores from Vostok and Byrd stations in Antarctica and from Camp Century in Greenland. Vostok is the simplest case glaciologically, Camp Century the most complex. On purely glaciological grounds it appears that the ice age gave way to present-day climates some 10000 B.P., the coldest period being 20000 B.P., when the climate in Antarctica was 6-8°C colder than at present. Glaciological data suggest a duration of 50,000 to 100,000 years for the last ice age. Before this period, climates in Greenland and Antarctica appear to have been around 2-3°C warmer than at present. (Auth)

33-4769

World's biggest moving job—icebergs.

Fales, E.D., Jr., *Popular mechanics*, Jan. 1978, 149(1), p.47-51.

Water supply, Ice (water storage), Iceberg towing.

This article describes methods of towing icebergs devised at Memorial University in Newfoundland and tested in the North Atlantic. The original impetus for the project came from the need to protect offshore oil platforms from iceberg flows but such technology would be applicable for towing icebergs to arid regions for use as drinking water, "floating freezers," and weather control devices.

33-4770

Relationship between mean stresses and local values of internal forces in a drifting ice cover.

Khelsin, D.E., *Oceanology*, Dec. 1978, 18(3), p.285-286, Translated from *Okeanologiya*. 4 refs.

Ice cover, Drift, Ice floes, Ice pressure, Ships, Ice navigation, Mathematical models.

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**COLD REGIONS  
SCIENCE AND TECHNOLOGY**

**VOLUME 33, PART 2, 1977**

*Bibliography on*  
**COLD REGIONS  
SCIENCE AND TECHNOLOGY**

**VOLUME 33, Part 2**

Geza T. Thuronyi, Editor

December 1979



UNITED STATES ARMY CORPS OF ENGINEERS  
COLD REGIONS RESEARCH AND ENGINEERING LABORATORY  
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HANOVER, NEW HAMPSHIRE, U.S.A.



## NOTE

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See: Ice breakup

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